NTT DATA

Sustainability Report
2019

Trusted Global Innovator

Contents

Editorial Policy

NTT DATA Group regularly publishes the Sustainability Report that outlines its efforts towards long-time value creation in a format that classifies them into ESG (environment, social and governance) initiatives as part of its endeavors for information disclosure related to CSR (Corporate Social Responsibility) and as a communication tool with stakeholders. By publishing the Sustainability Report, we also aim to respond to the growing demand from medium-to-long term investors for businesses to enhance information disclosure.

NTT DATA clarifies the Group's concepts of ESG management in its new Medium-Term Management Plan (FY2019-2021) and incorporates them into the Group's management strategy. In light of this, NTT DATA Group Sustainability Report 2019 introduces the Group's efforts towards the continuous improvement of corporate value by promoting social contributions through business and corporate activities. For other information, including on NTT DATA Groups' management strategies and the impact of non-financial activities on the Group's business activities, please refer to the Annual Report 2019, an integrated report of the Group's activities.

NTT DATA Corporate Website
https://www.nttdata.com/global/en/

Non-Financial Information	Financial Information
Sustainability	**Investor Relations**
https://www.nttdata.com/global/en/sustainability	https://www.nttdata.com/global/en/investors

NTT DATA GROUP Sustainability Report **2019**

Trusted Global Innovator

Sustainability Report

Trusted Global Innovator

Annual Report

• Results Briefing Materials
• Financial Results
• Corporate Governance Report

Organizations Covered

This report centers mainly on the activities of the NTT DATA Group in Japan while including data and details of certain activities conducted by Group companies outside Japan.

Group Overview https://www.nttdata.com/global/en/about-us/location-map

Period of Coverage

This report mainly covers initiatives undertaken in fiscal 2018 (April 1, 2018 to March 31, 2019). Details of certain activities that were conducted prior to fiscal 2019 or are planned for the future are also included in this report.

Guidelines Referenced in This Report

• Global Reporting Initiative (GRI) Sustainability Reporting Standards
• Japan's Ministry of the Environment Environmental Reporting Guidelines (2012)

Publication Date

October 2019 (Sustainability Report 2018 was published in October 2018; Sustainability Report 2020 is scheduled for publication in October 2020)

Disclaimer and Notes

• This report not only contains historical or current facts relating to NTT DATA Corporation and Group companies but also judgments, plans, and predictions based on information available at the time of publication. NTT DATA therefore cautions readers that forecasts of the results of business activities and events may differ materially from actual results and events.
• The names of products and services referred to in this report are trademarks or registered trademarks of NTT DATA and other Group companies or other companies in Japan and other countries.

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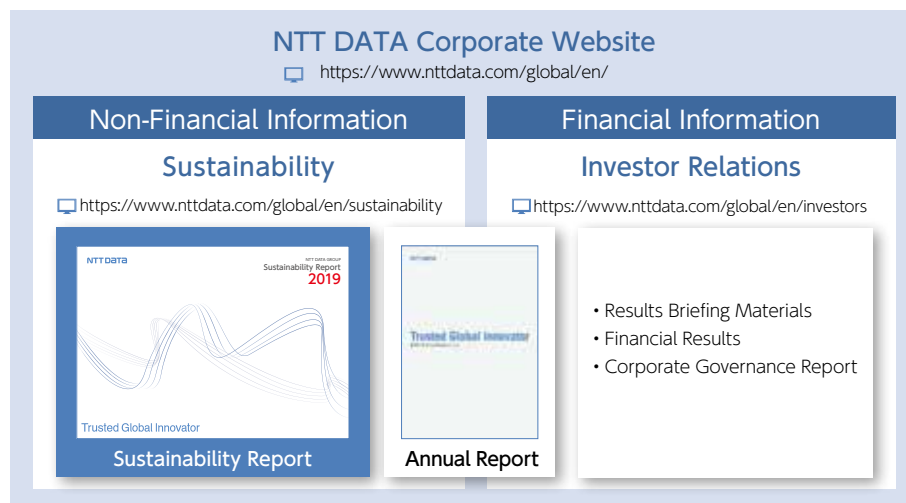
Message from the CEO

By contributing to society through our business, we aim to continuously increase our corporate value and create a future society together with our customers.

NTT DATA celebrates the 31st anniversary and throughout its history, NTT DATA has been guided by its Mission Statement of "NTT DATA uses information technology to create new paradigms and values, which help contribute to a more affluent and harmonious society."

We endeavor to fulfil our mission by creating new value that helps resolve social issues through building long-term relationships with clients.

In recent years, technological progress has been accelerating trends of digital transformation, spurring the diversification and sophistication of our customers' needs for strategic use of digital technology to expand business as well as to create new businesses. At the same time, businesses are expected to be part of international initiatives to tackle global social and environmental challenges, such as the UN Sustainable Development Goals (SDGs) and we are aware of the increasing expectations for NTT DATA to apply its core competency of IT to challenge the issues clients and society face.

Under the new Medium-Term Management Plan announced this year, we are pursuing profitable global growth with "consistent belief and courage to change." To achieve the goals we have clarified NTT DATA's way of ESG (environmental, social and governance) Management. In promoting ESG Management, and driving business in collaboration with our customers will result in our contribution to the achievement of many of the 17 SDGs.

The NTT DATA has been making the efforts to contribute to society through its business and corporate activities. One example of such efforts is the COTO LABO Consortium we announced in May 2019, an initiative by a consortium of eight companies including NTT DATA, aiming to digitize experiments on, for example, iPS cells. This consortium will serve as a next-generation laboratory in which the member companies across industries work together in life science fields to create new, unprecedented value, which will lead to the contribution to entire healthcare industry. Through such initiatives, we hope to contribute to society by our business.

As other examples of social contribution through our corporate activities, we will continue addressing work style reforms leveraging advanced technologies, operating environment-friendly Data Center, and developing human resource in the IT field.

While we hold "consistent belief" to continuously contribute to our customers and the society, and to keep providing our consistent value, it is important that we NTT DATA change ourselves with "courage to change."

We NTT DATA incorporate into our management strategy some important CSR challenges and conduct social contribution through our business and corporate activities, which will lead to sustainable increase of our corporate value.

President and Chief Executive Officer,
Representative Director

Company Data

Basic Data (As of March 31, 2019)

- ■ Company Name (Trade Name) : NTT DATA Corporation (NTT DATA)
- ■ Head Office : Toyosu Center Bldg., 3-3, Toyosu 3-chome, Koto-ku, Tokyo 135-6033, Japan
- ■ Telephone : +81-3-5546-8202 (Main switchboard)
- ■ Date of Establishment : May 23, 1988
- ■ Common Stock : ¥142,520 million
- ■ Fiscal Year : April 1 to March 31 of the following year
- ■ Independent Auditors : KPMG AZSA LLC

NTT Group–One of the World's Largest ICT Companies

NTT Group (Fiscal 2018)

Total Assets	Operating Revenues
¥22,295.1 billion	¥11,879.8 billion

Number of Employees	Consolidated Subsidiaries
303,351 people (Consolidated)	919 companies

NTT DATA Group (Fiscal 2018)

Total Assets	Net Sales
¥2,476.1 billion	¥2,163.6 billion

Number of Employees	Consolidated Subsidiaries
123,884 people (Consolidated)	307 companies

Business Domain

NTT DATA combines various IT services to deliver the optimal services to customers around the world.

Business Portfolio (Fiscal 2018)

Net Sales Breakdown
- Other 4.5%
- Public & Social Infrastructure Segment 18.8%
- Financial Segment 22.0%
- Enterprise & Solutions Segment 20.8%
- North America Segment 16.6%
- EMEA & LATAM 17.3%

Operating Income Breakdown
- Other 1.5%
- EMEA & LATAM 5.0%
- North America Segment 2.2%
- Public & Social Infrastructure Segment 27.6%
- Financial Segment 33.3%
- Enterprise & Solutions Segment 30.5%
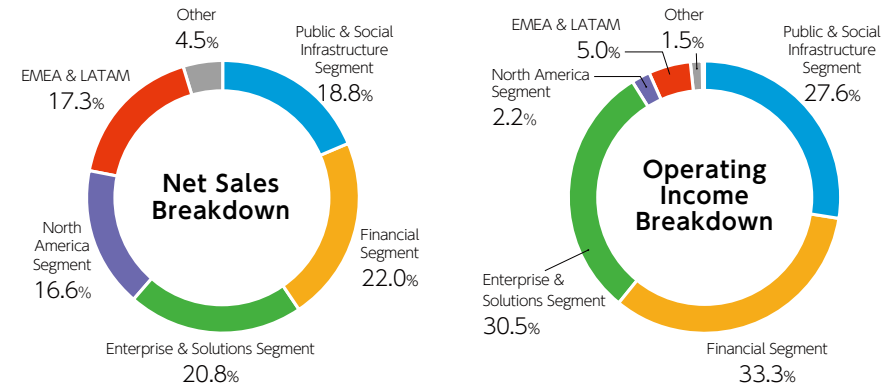
Segments	Main Business Fields	Net Sales Breakdown	Operating Income Breakdown
Public & Social Infrastructure	We provide high-value-added IT services that underpin government, medical, telecommunications, electric power, and other social infrastructure that invigorate regions, centered on Japan.	¥479.9 billion	¥43.9 billion
Financial	We provide high-value-added IT services that contribute to increased service and operational efficiency, centered on Japanese financial institutions.	¥559.1 billion	¥52.9 billion
Enterprise & Solutions	Centering on Japan, we provide high-value-added IT services that support business activities in the manufacturing, distribution, and services industries, as well as payment services and platform solutions linked with IT services in individual fields.	¥529.8 billion	¥48.5 billion
North America	We provide high-value-added IT services centering on North America, taking market characteristics into account.	¥421.9 billion	¥3.5 billion
EMEA & LATAM	We provide high-value-added IT services centering on EMEA & Latin America, taking market characteristics into account.	¥440.1 billion	¥7.9 billion

Message from the CEO | **Company Data** | Sustainability in the NTT DATA Group | Efforts to Make Social Contributions through Businesses | Social | Environment | Governance | GRI Standards

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A Growing Range of Business Fields

We cover a wide range of business domains on a foundation of close customer relationships and technological capabilities

Public Segment
Big Data and cloud computing to support local communities

Healthcare and Life Sciences
Activating databases for improved healthcare services

Banking and Financial Services
Client trust founded on reliable, advanced systems

Insurance
Expertise and creativity for leading insurance management systems

Telecommunications
Developing new opportunities and relationships with clients through telecommunications

Media and Entertainment
IT solutions for new media business creation

Education
Technology for new learning environments

Energy and Utilities
Generating dynamic environments while maintaining competitive advantage

Natural Resources
Supply chain expertise to conquer new challenges

Manufacturing
Greater efficiency for manufacturing process systems

Automotive
Advancing the automotive industry through technologies and systems

Electronics and High Tech
Helping to optimize development, manufacturing, and management

Transportation and Logistics
Supporting improvements in organizations and processes to take transportation and logistics forward

Wholesale and Distribution
Enabling the evolution of wholesale businesses through services that closely reflect business conditions

Retail
Supporting improvements in efficiency as well as growth in online sales

Service Providers
Helping clients capture opportunities in the rapidly changing service industry

Fundamental Technologies
Offering cloud computing that transforms data into a powerful business resource

Consumer Products
Providing online and mobile-based innovations for product development

Geographic Coverage (As of March 31, 2019)

The NTT DATA Group is an organization with more than 123,000 employees which engages in business activities in 223 cities in 53 countries and regions.

North America Employees Approx. **16,000**

India Employees Approx. **21,000**

China Employees Approx. **4,200**

EMEA& Latin America Employees Approx. **40,800**

APAC Employees Approx. **3,300**

Japan Employees Approx. **37,700**

53 countries and regions

223 cities

123,000+ professionals

Medium-Term Management Plan

Review of Previous Medium-Term Management Plan (FY2016–2018)

Under the central theme of "strengthen local presence," our previous Medium-Term Management Plan (FY2016–2018) set the targets of attaining more than ¥2 trillion in consolidated net sales and increasing consolidated operating income after adjustment by 50% (compared with fiscal 2015). We also undertook initiatives under two global strategies: "game-changing approach" and "breakthrough technology."

Management Goals

Net Sales Over ¥2 trillion

Net Sales
(Billions of yen)

2015	2016	2017	2018	(FY)
1,614.8	1,732.4	2,039.7	2,163.6	

—— JGAAP —— | —— IFRS ——

Achieved

Operating Income + 50% *
(Operating Income ¥142 billion)

Operating Income
(Billions of yen)

2015	2016	2017	2018	(FY)
100.8	117.1	123.1	147.7	

—— JGAAP —— | —— IFRS ——

Achieved

* Compared to FY2015
(Adjusted item: Incremental investment in new areas)
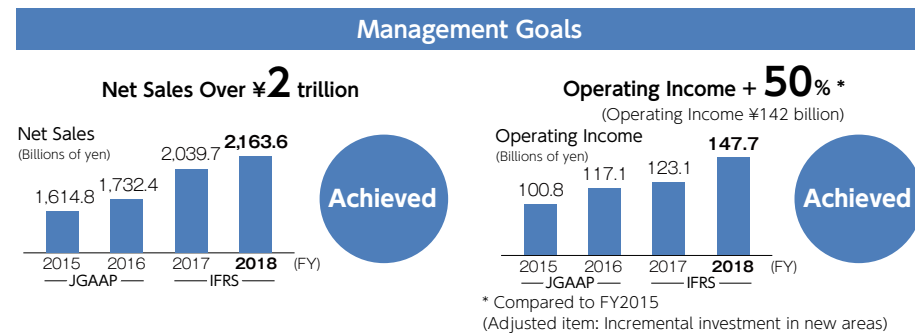
【Strategy Overview and Major Achievements】

● **Strengthen local presence**
→ In the IT services market, we increased our presence in 8 of 10 countries.

● **Game-changing approach**
→ We built a stronger client base and established a stable business foundation (client base*[1]: 70 companies).

● **Breakthrough technology**
→ We reduced costs through standardization, automation, and other production technology innovations, and formed globally consistent R&D facilities to support client digitalization initiatives

【Issues】

● **Maximize value for our clients**
→ To maximize value for our clients, we recognize the need to further accelerate digital transformation and maximize global synergy.

● **Prevent unprofitable projects**
→ With the exception of a specific project, we succeeded in reducing the number below our target level*[2] through such methods as establishing the Project Review Committee.

Due in particular to increasingly complex technologies, we need to further step up curtailment efforts.

● **Improve profitability of overseas businesses**
→ Although net sales grew significantly, profitability remains low, so substantial improvement is necessary.

*1: Clients with annual sales of over ¥5 billion (Japan) or US$50 million (ex-Japan)
*2: 0.3%–0.5% of consolidated net sales

New Medium-Term Management Plan (FY2019–2021)

～ Midpoint to Global 3rd Stage ～
Pursuing profitable global growth with consistent belief and courage to change

We reached the Global 2nd Stage under our previous Medium-Term Management Plan, which set the targets of consolidated net sales in excess of ¥2 trillion and an overseas sales ratio of around 50%. Our new Medium-Term Management plan is designed to propel us toward the Global 3rd Stage by around 2025. As such, this will be an extremely important three-year period.

Under the new Medium-Term Management plan, we aim to enhance our capabilities in four factors—growth, earnings, transformation, and synergy (GETS)—and promote profitable global growth.

Overview of the New Medium-Term Management Plan

Profitable Global Growth: FY2021 Business Goals

Growth	Net Sales ¥2.5 trillion	Client Base*[1] Over 80 rowth	Earnings	Operating Income Margin*[2] 8%	Overseas EBITA Margin*[2] 7%

COURAGE TO CHANGE — Maximize Value for Our Clients — Growth Driver: Digital & Global

Transformation & Synergy

Strategy 1	Strategy 2
Expand global digital offerings	Deliver greater value to clients based on regional needs

Strategy 3
Unleash our employees' potential that maximize organizational strengths

Drive NTT Group collaboration

CONSISTENT BELIEF — Shape the Future Society with Our Clients

*1: Clients with annual sales of over ¥5 billion (Japan) or US$50 million (ex-Japan)
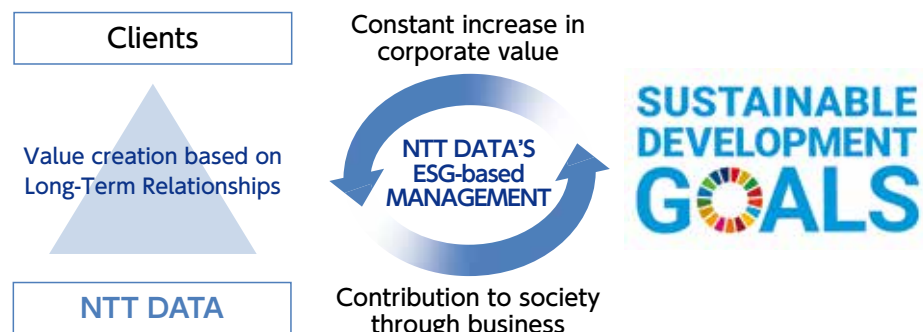*2: Excluding temporary costs such as M&A and structural transformation

CONSISTENT BELIEF — Shape the Future Society with Our Clients

To "shape the future society with our clients," we will contribute toward achieving the SDGs and cultivate ongoing increases in corporate value by creating value based on Long-Term Relationships with clients.

Specifically, we aim to contribute to society through our business by providing social infrastructure and business category-specific solutions in collaboration with our clients to help resolve social issues.

Furthermore, in our corporate activities we will embrace workstyle innovations, respect diversity, and promote other initiatives that give maximum consideration to social issues. As a result, we aim to minimize risk and maximize our employees' capabilities.

Clients

Value creation based on Long-Term Relationships

NTT DATA

Constant increase in corporate value

NTT DATA'S ESG-based MANAGEMENT

SUSTAINABLE DEVELOPMENT GOALS

Contribution to society through business

COURAGE TO CHANGE — Three Strategies for Maximizing Value for Our Clients

Amid the onward march of digitization and globalization, as well as the major changes taking place in our business environment, we recognize the need to change ourselves in order to maximize the value we provide to clients.

To this end, as we maintain the courage to change we will enact three strategies to step up our transformational and synergistic capabilities.

To date, we have operated our business based on strategies tailored to the characteristics of individual regions. In addition, going forward we will create offerings we can provide globally. We will approach global accounts strategically and unleash our employees' potential that maximize organizational strengths.

New Medium-Term Management Plan (FY2019~)

Strategy 1 — Expand global digital offerings

We will create offerings we can roll out globally and strategically approach global accounts. At the same time, we will bolster our global strengths overall by using our CoE to provide support for the offerings we have created and deploying the offerings into individual regions.

| Accelerate Global Marketing | Develop Digital Offerings | Expand CoE |

Strategy 2 — Deliver greater value to clients based on regional needs

In addition to providing the digital offerings we have created through Strategy 1, we will further enhance the value we provide to clients by continuing to utilize the "4D Value Cycle" (a value offering model shared throughout NTT DATA), taking into account market characteristics that differ by region and leveraging the Company's strengths.

| Region strategy Japan | Region strategy North America | Region strategy EMEA & LATAM | Region strategy China & APAC |

Strategy 3 — Unleash our employees' potential that maximize organizational strengths

We will unleash our employees' potential that maximize organizational strengths to support Strategy 1 and Strategy 2.

| Unleash Employee Potential | Digitize Our Work Environment | Enhance Our Governance Processes |

Our Way

Our world is evolving faster than ever.

As a company and as individuals, we think through what we do, act differently, and transform our business to drive a better future for the NTT DATA Group.

To this end, NTT DATA framed basic policies into Our Way. The direction we are heading is summarized there, on the basis of the Mission Statement.

Our Mission

Mission Statement	Employee Creed
Portrays NTT DATA's mission and reason for existence while serving as a foundation for management	Sets forth policies and action guidelines to which all of our employees should adhere

Pursuing Our Mission in a Changing Business Environment

Group Vision	Values
Indicates where NTT DATA aims to be in 10 years	Expresses what is most important for the realization of our Group Vision

Criteria that guide our daily actions with regard to ethics, laws, regulations

Global Compliance Policy

🖥 https://www.nttdata.com/jp/ja/about-us/mission/

Mission Statement

NTT DATA uses information technology to create new paradigms and values, which help contribute to a more affluent and harmonious society.

Employee Creed

1. We will do our utmost to serve our customers.
2. We will meet the challenges of our work with an active and positive spirit.
3. We will create a vital and vibrant company.

Group Vision

"Trusted Global Innovator"

The Group Vision indicates where the NTT DATA Group aims to be in 10 years.

The current era is unpredictable due to remarkable innovations in IT and rapidly accelerating business model transformation. Under these conditions, we must develop partnerships with customers based on long-term trust. To this end, rather than pursuing profit solely for ourselves, we will work closely with customers to realize their many different ideas while demonstrating our strengths. In this way we will create leading-edge technologies with global reach. At the same time, we will achieve business innovation and address societal issues.

By becoming the trusted business partner of customers worldwide, NTT DATA will build a significant presence in the global market.

Trusted Global Innovator

We realize the dreams of our clients around the world through long-term relationships.

We develop evolving ecosystems with our clients through leading-edge technologies.

We enhance our creativity by respecting diversity.

Values

An important step in working together and achieving the corporate transformation set out in our Group Vision is stating the values we esteem and seek to share. These values are as follows.

Clients First

First, and above all else, we place the needs of our clients.

We work continuously to understand your business and we strive to resolve every concern to your satisfaction. We feel responsibility to ensure your success and we let this obligation set the direction of our work and guide our actions.

Foresight

We never settle for the status quo. Instead, with speed and foresight, we anticipate challenges that lay ahead.

We consider the future of IT as well as the future of your business, work to enhance our ability to picture the future, and with our ecosystems, adapt to the changing business environment.
In this way, we help you to meet your goals and create a brighter future for society.

Teamwork

We put great importance on enabling our employees to achieve their best through their work with each other.

We believe that when a diverse group of individuals brings their unique world views together, shares their wisdom, and works toward a common goal, the results are extraordinary and far beyond what can be achieved by any one person.

Global Compliance Policy

Our Global Compliance Policy, shared throughout the NTT DATA Group, sets criteria that guide our daily actions with regard to ethics, laws, regulations, and overall business operations.

Preamble

To be a trusted company, trust by customers, shareholders, suppliers, and society is indispensable for a company to sustainably grow. A company can be trusted upon by being aware of its social responsibility ("CSR") and by fulfilling the expectation of, and enhancing the satisfaction of, customers and other stakeholders through good dialogues.

We also believe that it is fundamental to gain trust not only by complying with laws, regulations, and agreements but also by respecting various international norms, including human rights, acting with good morals and integrity, and performing fair and transparent business activities.

Furthermore, our mission is to create new "mechanisms" and "values" with IT and to help realize a more affluent and harmonious society, and we aim to help resolve the issues that the earth and society is facing.

With these in mind, everyone at NTT DATA will act in accordance with the Global Compliance Policy, and we will all do our utmost to be a trusted company.

Application

All directors, officers, and employees shall fully understand the Global Compliance Policy, and act as follows to achieve its purposes. Directors and officers shall take the initiative and strive to cultivate high morals in employees.

Principles

We will:
- Comply with all relevant laws and regulations of the jurisdictions where we do business, including international laws, and act in accordance with good integrity.
- Be aware of our CSR, and perform fair and transparent business activities.

For Customers

We will:
- Execute appropriate agreements with our customers, and provide systems and services pursuant to the agreement.
- Thoroughly manage customer information in accordance with the agreements, relevant laws, and regulations related to the protection of personal data.

For Shareholders

We will:

- Undertake sound corporate management and strive to increase the interests of our shareholders.
- Timely and appropriately disclose management information in order to perform transparent management.

To Competitors

We will:

- Restrict ourselves from performing any acts that would impede market competition, including defamation, dumping, cartels, and other unfair / anti-competitive conduct, and perform fair and free competition.
- Protect our own intellectual properties and respect the same of others.

To Suppliers

We will:

- Act with integrity without abusing a superior position.
- Comply with relevant laws and regulations applicable to transactions with suppliers, and observe agreements with suppliers.

To Governments

We will:

- Not provide any gift or hospitality against our policy or applicable laws, nor conduct any act that would be suspected of corruption.
- Not be involved in any bribery with government officials in any manner and in any jurisdiction.

To Society

We will:

- Actively undertake social contribution, such as volunteering or other community activities, to fulfill our responsibility as a good corporate citizen.
- Respect the diversity of cultures and values, and contribute to the development of societies where we do business.
- Refuse to do any business with anti-social forces.

To the Environment

We will:

- Propose IT systems and solutions to contribute to the reduction of the environmental load.
- Strive to reduce the environmental load caused by our business operations.
- Increase our awareness of biodiversity, and undertake activities to protect the natural environment.
- Observe laws and regulations related to the environment.

To Employees & Co-Workers

We will:

- Respect the individuality and personality of our people.
- Respect human rights and will not discriminate based on gender, nationality, belief, or religion.
- Not commit any harassment.
- Maintain fair and equal treatment of employees and provide employment opportunities on the basis of individual merit, in a working environment safe, secure, and free of violence, drugs, or child labor.

As Employees

Each employee will:

- Ensure that information security be maintained and not conduct any privacy infringement, unauthorized access, and other unlawful acts.
- Observe the Company policies and not engage in any act that conflicts with the interests of the Company or that provides personal gain to the detriment of the Company.
- Not engage in insider trading in any manner.
- Not provide or receive any gifts or hospitality against our policy from/to customers, suppliers, or business partners.
- Not post to any social media any confidential or proprietary information or any message that harms the trust or rights of any parties.
- Promptly report any breach or suspected breach of this policy or other unlawful act to his or her manager, local compliance officer, or whistleblowing line where appropriate. The Company will not make any retaliation to those who made good faith reporting through the whistleblowing line.

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CSR in the NTT Group

The NTT Group CSR Charter

The NTT Group has been working to achieve sustainable growth through the resolution of societal issues by referring to the NTT Group CSR Charter as its basic principles.

The NTT Group CSR Charter consists of the CSR Message, which states the Group's approach, and the four CSR Themes, which outline specific priority issues.

Ensure Reliable Communications

Enrich Social Communication

Create a sustainable society by delivering ICT solutions the highest-quality

Unite the Energies of Team NTT

Protect the Global Environment

The NTT Group CSR Charter
https://www.ntt.co.jp/csr_e/groupcsr/csr_policy.html

CSR Management

In fiscal 2005, NTT established the CSR Committee, chaired by the Representative Director and Senior Executive Vice President. CSR initiatives, which include economic, environmental, and social aspects, are thus managed continuously and properly. The CSR Committee meets at least once a year and discusses and makes decisions on basic strategies, initiatives, and information disclosure concerning the NTT Group's CSR. The Global Environmental Protection Promotion Committee and the Social Contribution Promotion Committee have also been established as subcommittees that handle specific themes.

In fiscal 2015, the Group CSR Committee, chaired by the chairperson of NTT's CSR Committee and comprising of the chief CSR officers (senior executive vice presidents and the executive vice president) of the eight major NTT Group companies, was established to implement CSR management across the Group. Group CSR Liaison Meetings, comprising staff in charge of CSR promotion at Group companies, are also held on a regular basis to share common challenges and successful examples from each Group company and to monitor progress on the implementation of our CSR Priority Activities with respect to plan-do-check-act (PDCA) cycles, thereby further promoting a sense of unity across the Group.

Awareness and Permeation of CSR at the NTT Group

The NTT Group has been convening the NTT Group CSR Conference, which the NTT DATA Group participates in every year, since fiscal 2013 to raise employee awareness of CSR and encourage them to think about the future of CSR and social contribution by sharing superior CSR initiatives across the Group.

The sixth conference took place in fiscal 2018, where 11 Superior CSR Measures (6 CSV[1] and 5 social contribution initiatives) were selected and presented.

The NTT DATA Group presented two CSV and two social contribution initiatives, of which "Significant Contribution to Labor Shortages and Workstyle Reform by Expanding Use of WinActor®/WinDirector® and Driving the Domestic RPA Market" and "Sustainable Development of the Farmbot Network" were awarded the First Prize.

More than 200 employees, including directors from each NTT Group company and the CSR members from NTT DATA Services, participated the conference and actively exchanged opinions regarding each initiative, contributing to a conference that further raised CSR awareness.

NTT DATA Group presenters

Conference hall

Presentation by NTT DATA UK

*1: CSV: Creating Shared Value

Message from the Director Responsible for Corporate Strategy

Advancing ESG management and building the future society by co-creating shared value with our clients and stakeholders

Keiichiro Yanagi
Senior Executive Vice President and Representative Director

Identifying 12 Material CSR Issues

NTT DATA publishes the annual report titled "NTT DATA Technology Foresight", covering anticipated future trends based on surveys and researches on advanced technologies and societal trends which are expected to significantly impact society and businesses in the next three to ten years. Based on "NTT DATA Technology Foresight 2019" as an input, twelve Material CSR Issues were identified by reflecting key societal challenges and expectations for NTT DATA through client satisfaction surveys, employee satisfaction surveys, and interviews with shareholders, ESG institutional investors, and experts from NPOs.

The twelve issues have been selected with a particular focus on social contribution through our business. While it is true that NTT DATA can contribute to society directly through corporate activities in some cases, we consider helping client's initiatives to contribute to society is of greater importance, in light of the environment surrounding us.

Securing and Nurturing IT Talent and Promoting IT Education

In the IT services industry where NTT DATA operates, securing talent is on top of the agenda to ensure sustainable business. While initiatives to hire talent with subject matter expertise from the market are important, it is also extremely crucial to upskill internal human resources within the Group to the level which can meet expectations of our clients and society. In addition, we will help our clients nurture their people through activities of NTT DATA UNIVERSITY by leveraging know-how accumulated based on our talent development programs in the Group.

Looking outside Japan, still many counties and regions suffer from poverty. Gaining IT knowledge can provide an effective path as a breakthrough from poverty or severe inequalities. The NTT DATA Group will strive to provide IT education in order to secure IT talent and contribute to raising income levels in the regions.

Innovating Workstyles and Promoting Diversity and Inclusion

We have been promoting workstyle innovation within the Company by introducing the RPA tools WinActor® and WinDirector®, which help innovate workstyle and improve productivity by streamlining and automating office operations. The number of licenses of these tools has exceeded 15,000 including indirect sales through our distributors, helping clients promote their workstyle innovation.

In addition, our company has long been encouraging telework. During the Telework Days campaign in 2019 designed as a trial to prepare for the upcoming Tokyo 2020 Olympic Games, 77% of the 11,000 employees in the Head Office worked remotely. Based on the insights gained from this experience, we will continuously support our clients' workstyle innovation.

Diversity and inclusion is no doubt integral in promoting innovation. Our company supports and has signed the Women's Empowerment Principles (WEPs) and has continuously been promoting diversity on the global basis. In 2018, we were recognized under the Diversity Management 100 Prime program, in which companies making continuous efforts in promoting diversity are commended. In the future, it will be important not only to empower women and employees of different nationalities but also to accept diverse ways of working based on individual circumstances. We therefore intend to facilitate a mechanism to enable diverse workstyles, while supporting clients and society to transform by widely rolling out such systems.

Responding to Climate Change

We not only strive to reduce greenhouse gas emissions at our data centers and offices by improving energy efficiency, but also contributes to addressing environmental problems with our strength of project management and by providing support using leading-edge technologies. Case examples include MefCO₂ Project to Convert Carbon Dioxide into Renewable Energy, an EU-funded project undertaken by i-deals, one of subsidiaries of the everis Group.

NTT DATA has also successfully achieved significant reduction of paper documents and the movement of people and goods by consolidating information in servers and digitizing meetings. Reduced movement of people, goods, and money enabled by IT is expected to help significantly curb growing climate change contributors and we will continue to step up these measures through our business activities.

Ensuring Information Security and Protecting Data Privacy

As IT is widely used in every corner of society, information security risks increase, and appropriate responses to such risks have become essential. Meanwhile, prioritizing information security alone can discourage proactive use and sharing of information, making it difficult to leverage useful data and know-how as an asset of the company. We therefore continuously work on research and development of technology based on societal, technological, and business trends as well as the latest situations in information security. We will tap into these outcomes for clients and the Company's systems to balance between information security and proactive use and sharing of information.

Disaster Risk Response

NTT DATA provides many information systems and services that support social infrastructure. When systems or services provided by NTT DATA went down in the event of a disaster, it would significantly affect society and people's daily life. Therefore, we will continuously make efforts in ensuring and improving business continuity plans (BCPs) at a time of disaster particularly for internal critical systems and those systems we operate for clients, while leveraging such expertise in building and operating clients' IT systems.

Ensuring Compliance and Promoting Responsible Supply Chain

Pursuant to what Japan's Corporate Governance Code constitutes, NTT DATA positions the followings as a basic policy and will make further efforts to enhance them: transparency and soundness in business management; optimized and swift decision-making and business execution; and ensuring through compliance. We will continue to build a foundation that conforms to expectations of global society by striving to ensure compliance, such as to foster a corporate culture of staying in compliance with laws and corporate ethics and to promote further improvement of internal structures and mechanisms.

As per laws and corporate ethics, rigorous compliance within the NTT DATA Group alone does not mean that we respond to society's expectations, should our efforts of promoting business lead to an increase of negative CSR behaviors, such as violation of laws and regulations at our vendors or business partners. Along with disseminating the Guidelines for CSR in Supply Chain, which set forth appropriate procurement policies, the NTT DATA Group will continuously promote open and fair transactions, work to improve quality and workplace environments through proactive communication with its business partners, and achieve mutual growth together.

Providing Social Infrastructure and Vertical-specific Solutions by Leveraging Advanced Technologies

The fast pace of technological innovations is making it difficult for our clients to plan innovative projects using advanced technologies. Against this backdrop, NTT DATA gathers insights globally and develops solutions by harnessing our digital technologies in business fields and domains where we have strength. We thus accelerate use of IT by our clients, helping them address their agenda in society, such as those featured in the SDGs. (See Strategy 1 on Page 7)

Building and Stably Operating IT Infrastructure

NTT DATA provides a number of information systems and services that support social infrastructure. As a result, system failures and suspended services would significantly affect not only our clients but also society and citizen's life. While it is important to endeavor to help clients solve their challenges based on new technology needs and requirement from society, we recognize operating existing systems stably is a critical mission for us.

Trusted Global Innovator

It is important to meet the expectations of our stakeholders, including clients, shareholders, institutional investors, employees, business partners, and communities and win further trust in order to promote ESG-oriented management under our Group Vision to become Trusted Global Innovator.

NTT DATA will continue to take solid steps to further enhance ESG-oriented management by contributing to stakeholders through our business activities and living up to their trust and expectations.

Sustainability in the NTT DATA Group

ESG Management

In recent years, there has been a growing movement to evaluate companies and their relationship with society in terms of environmental, social, and governance (ESG) factors that stems from a demand that companies make a global response to social and environmental issues as represented by the Sustainable Development Goals (SDGs).

In keeping with the mission statement of the Group, to "use information technology to create new paradigms and values, which help contribute to a more affluent and harmonious society," our business itself resolves issues faced by our clients and society, using the power of IT. With technology advancing in leaps and bounds, and digital transformation accelerating in kind, we sense a growing expectation upon us to fulfill this duty.

Bearing this in mind, we have clarified our stance on ESG under the title "NTT DATA'S ESG-based MANAGEMENT" and incorporated it into the management strategy of our new Medium-Term Management Plan (FY2019–2021). Based on our consistent belief and our basic concept of "shape the future society with our clients," we will provide solutions for the sustainable development of our clients and society, while contributing to resolve social issues through our corporate activities, which take into account cultivating IT talent, implementing workstyle transformation, and respecting diversity, etc., and sustainably enhancing our corporate value.
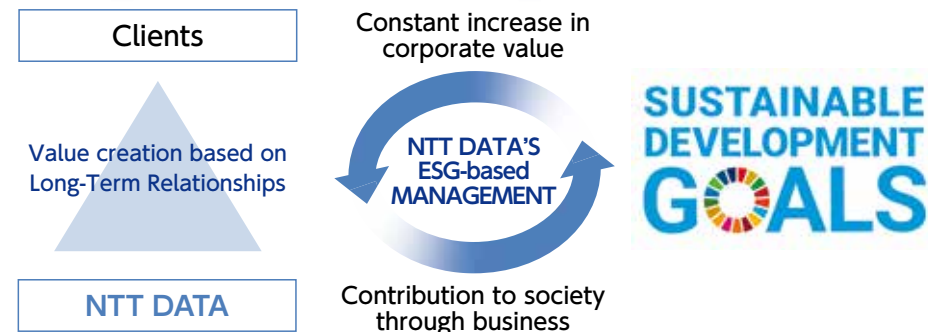
CSR Management

System for Promoting CSR

NTT DATA manages its CSR activities under the leadership of representative director and senior executive vice presidents and executive officers. The ESG Promotion Department handles related operations such as compiling information, training employees, and engaging with outside entities, and each workplace carries out CSR activities to contribute to resolving societal issues.

Stakeholder Engagement

In business, there are always opportunities to engage with stakeholders in dialogue and make improvements based on these conversations. We value the conversations we have on a daily basis and instill within the Group our commitment to our stakeholders while at the same time considering what society at large expects of us as we strive to address societal issues.

"Shape the Future Society with Our Clients."

Clients

Value creation based on Long-Term Relationships

NTT DATA

Constant increase in corporate value

NTT DATA'S ESG-based MANAGEMENT

Contribution to society through business

SUSTAINABLE DEVELOPMENT GOALS

Key Stakeholders

Clients — Shareholders and investors — Business partners — Governments — Employees — Regional communities, NPOs and NGOs — NTT DATA Group
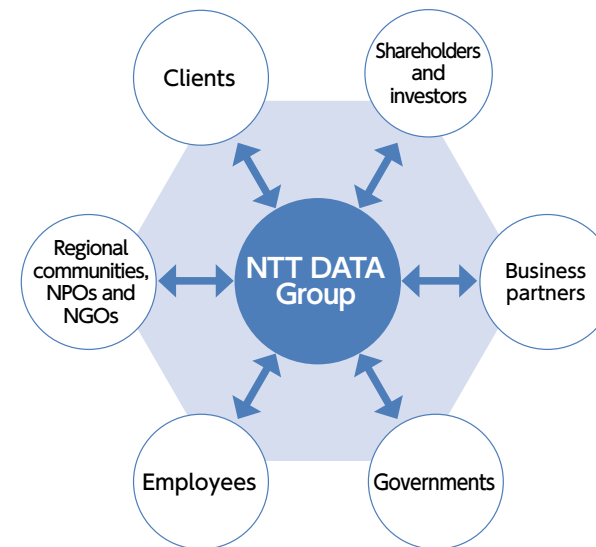
Overview of Stakeholder Engagement

Stakeholders		Related Material CSR Issues	Main Approach
Clients	• All our clients, including corporations, that use services provided by the NTT DATA Group	• Offer social infrastructure and business-category-specific solutions based on advanced technologies • Build and ensure stable management/operation of IT infrastructure • Ensure information security • Protect data privacy	• Regular sales and proposal activities • Client satisfaction surveys (questionnaires, interviews)
Shareholders and investors	• Shareholders of the NTT DATA Group and other individual and institutional investors	• Offer social infrastructure and business-category-specific solutions based on advanced technologies • Secure and develop IT human resources	• Annual General Meeting of Shareholders • Annual reports • Investor relations (IR) website • Financial results briefings • Shareholder newsletters
Governments	• Central and local governments overseeing policies on the IT service industry, employment, the economy, and the environment	• Offer social infrastructure and business-category-specific solutions based on advanced technologies • Build and ensure stable management/operation of IT infrastructure • Ensure information security • Protect data privacy • Ensure compliance • Promote workstyle innovation • Promote diversity and inclusion	• Various applications and reports • Consultative meetings, committee meetings, and research committees held by government agencies • Committee meetings and investigative meetings, held by industry groups and organizations
Regional communities, NPOs and NGOs	• Local communities and NPOs involved with NTT DATA Group companies through our core businesses	• Promote workstyle innovation • Promote diversity and inclusion • Promote IT education • Respond to climate change • Protect data privacy	• Participation in community events • Collaboration with/sponsoring of social contribution activities • Feedback via our website • Advisory boards
Business partners	• Business partners that cooperate in providing NTT DATA Group services	• Promote responsible supply chain	• Regular business activities • Business Partner (BP) Presidents' Meetings • Discussion meetings • Technological briefing sessions
Employees	• Employees of the NTT DATA Group and their families	• Secure and develop IT human resources • Promote workstyle innovation • Promote diversity and inclusion	• Employee satisfaction surveys • Management/employee town halls • Proposal Patio (bottom-up suggestion system) • Helpline • Counseling

Advisory Board Established to Incorporate Opinions and Proposals into Business Activities

In July 2012, the NTT DATA Group set up its first advisory board comprising business owners and academic experts.

During the past three terms over six years, a total of 17 outside experts advised us from experts' points of view on ways to address management issues of the Company and initiatives to expand global business, which we incorporated into our business administration. In February 2019, the fourth advisory board was set up.

We will incorporate their opinions and proposals, which are based on the members' exchange of views on aspects of our management and on societal issues, into business activities.

🖥 https://www.nttdata.com/jp/ja/news/release/2019/022803 (Japanese Version Only)

Period	3rd period	4th period
Term	From October 2017 to September 2018	From February 2019
Frequency of Meetings	Twice a year	
Advisory Board Members (Honorific titles omitted, in alphabetical order)	• Noriko Arai Professor, National Institute of Informatics Director, Research Center for Community Knowledge • Yoshinori Ando President, Ando Yoshinori Office • Fumihiko Ike Former Chairman, Honda Motor Co., Ltd. • Shuzo Kaihori Director and Advisor, Yokogawa Electric Corporation • Hirohide Yamaguchi Chairman of the Advisory Board, Nikko Research Institute, Inc.	• Shinichiro Ito Chairman of the Board, ANA Holdings Inc. • Naoyuki Iwashita Professor, School of Government, Kyoto University • Isao Endo Chairman (Japan), Roland Berger Ltd. • Kazuhiro Mishina Professor, Graduate School of Business Administration, Kobe University • Atsuko Muraki Guest Professor, Tsuda University
Agenda for Discussion	• Global strategies • Initiatives in digital businesses • Initiatives aimed at acquiring competitive advantage for the Company in light of social changes	• Issues in the previous Medium-Term Management Plan • Dissemination and penetration of the new Medium-Term Management Plan • Promoting ESG management (workstyle innovation, etc.)

*Titles of the members are based on the information in the press release announcing the selection of the members.

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Identifying Material CSR Issues

In light of ESG management in the medium-term management plan starting in 2019, we identified new Material CSR issues referring to the guideline for non-financial reporting, "GRI Guidelines".

Process of Identifying Material CSR Issues

Step 1 Identifying issues 60
Issues in NTT DATA Technology Foresight 2019 were extracted as societal issues.

Step 2 Selecting issues 15
The materiality of the issues was reviewed based on the materiality for society and the materiality for the Company, and issues relevant to the Company were selected and prioritized.

Step 3 Determining issues 12
The Board of Directors, comprising important decision makers of the Company, judged the appropriateness of the identified material issues and determined the issues.

Step1: 60 issues

Identification of issues that have an internal and external impact

NTT DATA Technology Foresight

Step2: 15 issues

[Information on materiality for society (stakeholders)]
- Client satisfaction surveys (approx. 520 companies)
- Employee satisfaction surveys
- Interviews with shareholders and investors
- Organizing and analyzing results of evaluation by research/rating agencies; Interviews with experts from NPOs/NGOs
- Politics and administration (SDGs, Society 5.0)
- Written surveys for major suppliers etc.

[Materiality criteria for the NTT DATA Group]
- Our Way (Mission Statement, Group Vision, Global Compliance Policy, etc.)
- Medium-Term Management Plan
- Ethics Guide/Information Security Policy/Guidelines for CSR in Supply Chain
- The NTT Group's Human Rights Charter/The NTT Group CSR Charter etc.

[External standards, trends, and frameworks]
- GRI Standards, ISO26000, etc.

Step3: 12 issues

Materiality matrix for CSR issues

: Business : Society (employees) : Society (community)
: Environment : Governance

(Materiality matrix — vertical axis: Materiality for society (stakeholders), Low to High; horizontal axis: Materiality for the NTT DATA Group, Low to High)

- Promote IT education
- Respond to climate change
- Offer social infrastructure and business-category-specific solutions based on advanced technologies
- Build and ensure stable management/operation of IT infrastructure
- Ensure information security
- Protect data privacy
- Secure and develop IT human resources
- Promote workstyle innovation
- Promote diversity and inclusion
- Respond to disaster risks
- Ensure compliance
- Promote responsible supply chain

Initiatives going forward

By the end of fiscal 2019, we will set targets linked to the new Material CSR Issues. From fiscal 2020 onward, we will manage and evaluate the status of implementation based on the targets and implement the PDCA cycle.
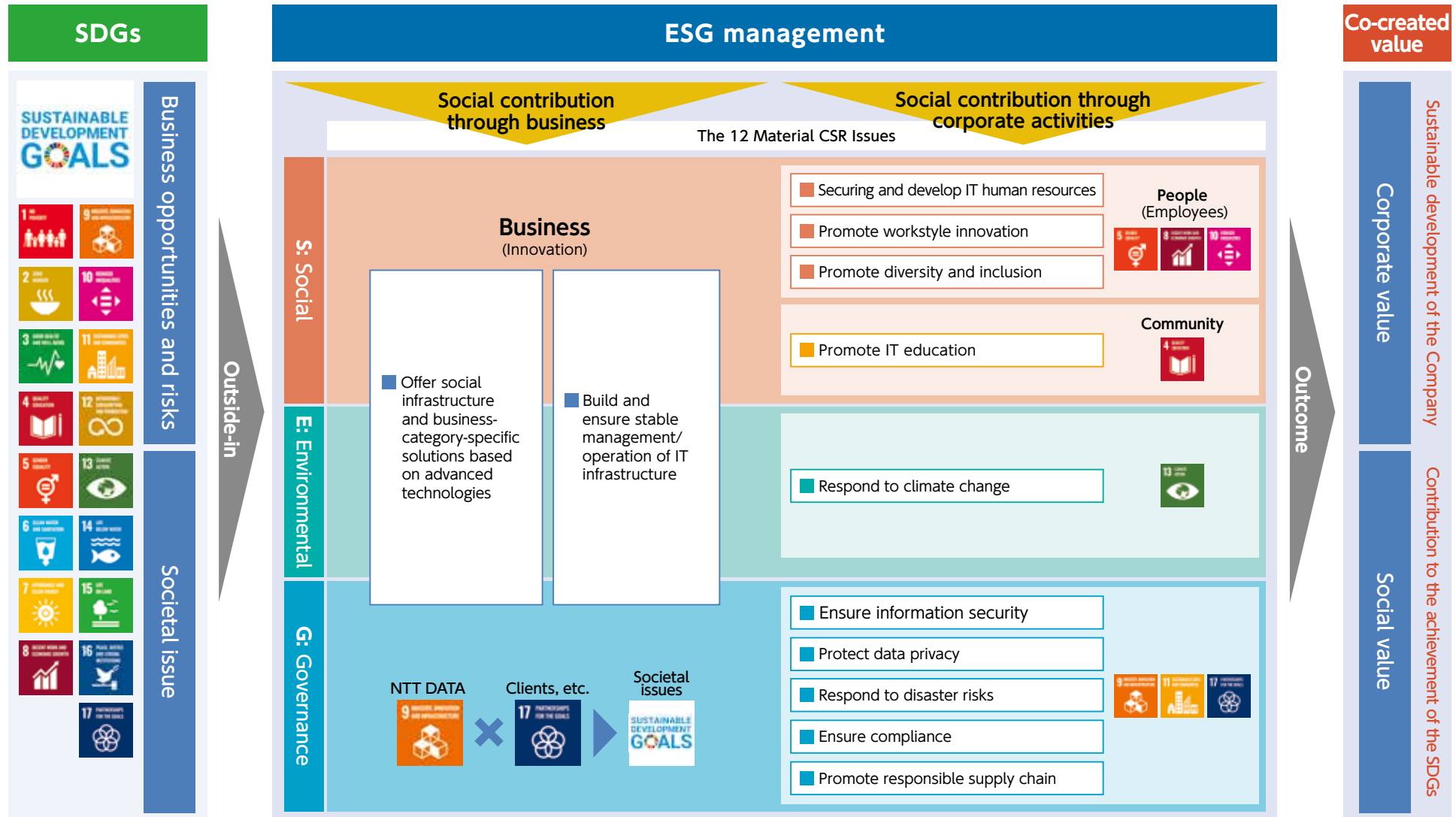
Newly Identified Material CSR Issues

NTT DATA Group has selected the following 12 items as its new Material CSR Issues. We will establish the goals to pursue based on these newly identified Material CSR Issues in order to proceed with the implementation of ESG management.

Category	Material CSR Issues	Content
Business (Innovation)		
	■ Offer social infrastructure and business-category-specific solutions based on advanced technologies	Providing our clients with services that harness digital and other advanced technologies in order to address societal issues
	■ Build and ensure stable management/operation of IT infrastructure	Maintaining a high quality of services for our clients and ensuring stable management/operation of such services expected of a company taking charge of infrastructure
Social — People (Employees)	■ Secure and develop IT human resources	Procuring talented IT human resources externally, developing them internally through in-house training, etc., and minimizing turnover
	■ Promote workstyle innovation	Eliminating the practice of having employees work long hours, providing an employee-friendly workplace environment conducive to a good work-life balance and improving the productivity of employees
	■ Promote diversity and inclusion	Increase diversity in the workplace and having all employees understand what diversity is all about while helping them to harness their unique abilities and experience
Community	■ Promote IT education	Providing children, citizens and NPOs/NGOs with IT literacy and skills by harnessing the Group's strengths in its core business field
Environment	■ Respond to climate change	Working to reduce greenhouse gas emissions by establishing long-term plans towards the goal and taking necessary measures including promotion of energy efficiency in the Group's data centers and office buildings
Governance	■ Ensure information security	Protecting the information assets of our clients and the Group against cyber attacks and other risks
	■ Protect data privacy	Treating personal information in a proper manner and protecting the human rights of the Group's clients and other stakeholders
	■ Respond to disaster risks	Developing the Group's Business Continuity Plans (BCPs) and improving them continuously so as to minimize damage from possible threats
	■ Ensure compliance	Preventing compliance violations by keeping all employees informed of the Group's Global Compliance Policy and ensuring its full implementation
	■ Promote responsible supply chain	Asking the Group's business partners for their cooperation in respecting human rights and the environment as well as ensuring compliance based on the Guidelines for Promoting CSR in Supply Chains, etc.

Social contribution through business / Social contribution through corporate activities

The NTT DATA Group and ESG Management

The Mission Statement of the NTT DATA Group calls on it to "use information technology to create new paradigms and values, which help contribute to a more affluent and harmonious society." In accordance with this Mission Statement and in light of the SDGs, we will conduct business management with an emphasis on ESG factors (ESG management). Thus, while co-creating value with customers and other stakeholders, we will focus on Material CSR Issues that we have identified as having particular importance for us.

SDGs

Business opportunities and risks

Societal issue

Outside-in

ESG management

Co-created value

Social contribution through business

Social contribution through corporate activities

The 12 Material CSR Issues

S: Social

Business (Innovation)

- Offer social infrastructure and business-category-specific solutions based on advanced technologies
- Build and ensure stable management/operation of IT infrastructure

Securing and develop IT human resources

Promote workstyle innovation

Promote diversity and inclusion

People (Employees)

Promote IT education

Community

E: Environmental

Respond to climate change

G: Governance

NTT DATA × Clients, etc. ▶ Societal issues

Ensure information security

Protect data privacy

Respond to disaster risks

Ensure compliance

Promote responsible supply chain

Outcome

Corporate value

Sustainable development of the Company

Social value

Contribution to the achievement of the SDGs

Third-Party Evaluations

NTT DATA's CSR initiatives have been highly rated by a number of domestic and overseas research agencies, and the Company has been selected as a component of various ESG indices (as of September 2019).

■ **Dow Jones Sustainability World Index/Asia Pacific Index**
An index developed by Dow Jones and RobecoSAM, which rates the sustainability of a company from economic, environmental, and social perspectives.

MEMBER OF
Dow Jones Sustainability Indices
In collaboration with **SAM** a RobecoSAM brand

■ **FTSE4Good Index**
An SRI index designed to promote investment in companies that meet global standards related to ESG criteria.

FTSE4Good

■ **FTSE Blossom Japan**
An index created by FTSE Russell that assesses excellent Japanese companies on criteria related to ESG.

FTSE Blossom Japan

■ **Prime Rating by oekom**
CSR ratings by oekom research AG of Germany.

Corporate Responsibility Prime
rated by ISS-oekom▶

■ **RobecoSAM Sustainability Award Gold Class**
RobecoSAM Sustainability Award given by Switzerland-based RobecoSAM, which conducts evaluations and research focused on SRI.

SAM Sustainability Award **Gold Class 2019**

Commitment to Outside Initiatives

The NTT DATA Group has adopted a preventive approach and participates in outside organizations, including those listed below, to share information on societal issues and engage in discussions.

● Japan Data Communications Association (Board member)
● Japan Electronic Payment Promotion Organization (Chair)
● Japan Business Federation
● The Telecommunications Association
● Japan Association of Corporate Executives

Awards

Received the ICT Business Encouragement Award from the Telecommunications Association

In May 2018, Ken Tsutsui, Section Manager, e-Community Division, Public Segment 1, NTT DATA Corporation, received the ICT Business Encouragement Award from the Telecommunications Association. His role in planning, development, and service provision of AW3D, the world's most precise global digital 3D map, was recognized as a significant contribution to the promotion, dissemination, and development of technology in the ICT business.
https://www.nttdata.com/jp/ja/news/information/2018/051801/ (Japanese Version Only)

Received the Good Design Award 2018 for Activities to Promote the Use of Vertical Text in Web Design

In October 2018, the Good Design Award in the media, content, and packaging category was awarded to the activities to promote the use of vertical text in web design, which had been taking place with the cooperation of NTT DATA INSTITUTE OF MANAGEMENT CONSULTING, Inc. The activities' contribution to the diversification of web design expressions was recognized.
https://www.nttdata.com/jp/ja/news/release/2018/100400/ (Japanese Version Only)

Received a Gold Award (Top-level) in the PRIDE Index 2018

In October 2018, NTT DATA received a Gold award (top-level) in the PRIDE Index 2018, which rates companies' initiatives related to lesbian, gay, bisexual, transgender (LGBT) and other sexual minorities. The Company received a Gold award two years in a row since 2017.
https://www.nttdata.com/jp/ja/news/information/2018/101101/ (Japanese Version Only)

Mitaka Data Center EAST Obtained LEED Gold Certification

In November 2018, the Center obtained the Gold certification based on LEED version 4 (the latest version) in recognition of its environmental performance, such as use of gray water and high efficiency air conditioning. It is the first data center facility in Japan that obtained the certification.
https://www.nttdata.com/jp/ja/news/information/2018/112201/ (Japanese Version Only)

Received the Grand Prize in the Data Center Category at the 12th ASPIC Awards for Mitaka Data Center EAST

In November 2018, the Center received the Grand Prize in the Data Center Category by obtaining the highest scores for the following evaluation items: environment, safety, level of technology, contribution to customers, and endeavor to launch a new business.
https://www.nttdata.com/jp/ja/news/information/2018/111301/ (Japanese Version Only)

Named a Leader in the NelsonHall Report for UX-UI Services

NTT DATA was recognized as a Leader in the NelsonHall NEAT report for UX-UI Services 2019*, published in November 2018.
* The report examines the services of 15 vendors that globally offer UX-UI (user experience) services and have the ability to address clients' issues.
https://www.nttdata.com/global/en/media/press-release/2019/march/ntt-data-recognized-as-a-leader-in-ux-ui-services-by-nelsonhall

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Ranked Ninth in the Brand Finance IT Services 15 2019 Report

In February 2019, Brand Finance, a brand valuation and strategy consultancy in more than 20 countries, calculated and ranked the brand value of IT services companies across the world using a unique methodology. NTT DATA appeared in the ranking for the first time and was the highest-ranked Japanese company.

https://ro.nttdata.com/News/2019/03/NTT-DATA-Is-Ninth-Most-Valuable-IT-Services-Brand

Named a Leader in Everest Group's Internet of Things (IoT) Services PEAK Matrix™ Assessment 2019

In February 2019, NTT DATA was recognized as a Leader in Everest Group's report Internet of Things (IoT) Services PEAK Matrix™ Assessment 2019. Recognition as a Leader is based on corporate value and advanced IoT services and is proof of the ability to bring about large-scale innovation to clients and excellent consulting ability toward engagement and innovation.

https://us.nttdata.com/en/-/media/assets/reports/everest-group-peak-matrix-for-iot-services-ntt-data.pdf

Ranked among Top 10 in Blockchain Services Report by U.S.-based HFS

In March 2019, NTT DATA was ranked among the top 10 in the overall ranking in the HFS Top 10 Enterprise Blockchain Services 2018 report by U.S.-based HFS Research. In solution maturity, the Company was ranked top.

https://us.nttdata.com/en/news/press-release/2019/march/ntt-data-ranked-among-top-10-blockchain-providers-in-2018-enterprise-blockchain-report-by-hfs

Received the Winner Award (Top Award) for WinActor/WinDirector® Ecosystem at the JISA Awards 2019

In June 2019, the system received the Winner Award (top award) in recognition of the totalized service with added value and the fact that it is used by more than 3,000 companies in over a dozen countries around the world.

https://www.nttdata.com/jp/ja/news/information/2019/061100/ (Japanese Version Only)

Mitaka Data Center EAST Certified in NVIDIA's DGX-Ready Data Center Program

In the DGX-Ready Data Center Program, data centers where the NVIDIA DGX system, the core system in AI data centers, can be installed and managed are certified by NVIDIA as official colocation partners. In July 2019, Mitaka Data Center, where accelerated computing products* are appropriately installed, was certified as an official colocation partner.

* Accelerated computing is a computer environment where the processing, previously done by single CPU, is parallelized and complex calculation is processed faster by using accelerators, such as GPUs.

https://www.nttdata.com/jp/ja/news/information/2019/071200/ (Japanese Version Only)

Ranked Fourth in U.S.-based HFS's Ranking of IT Services for the Healthcare Industry

In August 2019, NTT DATA was ranked fourth overall in the HFS Top 10 Healthcare Services report by HFS Research, which analyzes the IT services industry and relevant companies. In category rankings, the Company was ranked top in provider industry coverage and global client mix, as well as second in IT services size and experience.

https://www.nttdata.com/jp/ja/news/information/2019/080900/ (Japanese Version Only)

Named a Leader in 2019 IoT in Digital Transformation NEAT Evaluation by NelsonHall

In August 2019, NTT DATA was identified as a Leader in manufacturing, retail, and supply chain, in recognition of the ability to not only deliver immediate benefit to clients but also meet the clients' future requirements.

https://uk.nttdataservices.com/en/news/press-release/2019/july/ntt-data-identified-as-a-leader-in-2019-iot-in-digital-transformation-neat-evaluation-by-nelsonhall

Certified as Top Employers 2019

In February 2019, NTT DATA Germany, everis Spain and everis Brazil were awarded the Top Employers certification for the year by the Top Employers Institute, for the excellent human resource management.

https://www.top-employers.com/en/certified-top-employers/

Selected as Top CEOs on Glassdoor

In June 2019, Simon Williams, CEO of NTT DATA UK, was selected as Top CEOs 2019 in UK based on reviews and ratings from employees for the CEOs.

https://www.glassdoor.co.uk/Award/Top-CEOs-UK-LST_KQ0,11.htm

Selected as the Top Employer in the Most Attractive Employers Survey in Cluj, Romania

In 2018, NTT DATA Romania was selected as the Top Employer in the Most Attractive Employers Survey conducted in Cluj, Romania by Catalyst Solutions.

https://www.hipo.ro/locuri-de-munca/vizualizareArticol/2519/Top-40-cei-mai-doriti-Angajatori-din-Cluj--3"

Won Gold Medal in the Brandon Hall Excellence Awards Program 2019

In August 2019, the In-house Certification Program offered by NTT DATA Learning Certification Institute (NLCI) of NTT DATA Services received a gold medal in the Award's Learning category for having excellent capabilities to meet ever-changing business needs.

http://www.brandonhall.com/excellenceawards/excellence-learning.php?year=2019

Efforts to Make Social Contributions through Businesses

NTT DATA Group strives to make social contributions through its businesses while working to promote a sustainable society by collaborating with its stakeholders.

CASE 01 Helping Address Issues Facing the Global Environment and Humanity by Utilizing Our "AW3D" Global High-Resolution 3D Map with the World's Highest Accuracy — P22

CASE 02 "Automate Routine Business Processes to Make More Time for Creative Tasks with "WinActor®/WinDirector®"" — P24

CASE 03 Commercial Farming Support Platform that Assists Smart Farming — P26

CASE 04 "CAFIS" A Platform that Provides Continuous Support for Cashless Payments in Japan, 24 Hours a Day, 365 Days a Year — P28

CASE 05 AI Diagnosis Support Solutions — P30

CASE 06 "AMLAD®" A Digital Archive Application that Helps Develop a Platform for Preserving Digitized Historical Documents and Making Them Available to the Public — P32

CASE 07 Projects to Verify the Feasibility of Predicting the Onset of Lifestyle-related Diseases by Using AI-related Technologies — P33

CASE 08 "Mitaka Data Center EAST" A Data Center that Has One of the Largest and Most Advanced Features in Japan While Achieving Excellent Environmental Performance — P34

CASE 09 Aiming to Foster Culture of Innovation and Resolve Societal Issues through "Global Hackathon" — P35

CASE 10 "Immigration Control System" for Improving Convenience for Travelers and Efficiency of Immigration Procedures Using Biometric Authentication — P36

CASE 11 "Converting CO_2 into Renewable Energy" — NTT DATA Contributes to Environmental Impact Reduction through Participating in an EU-led Project — P37

CASE 12 "COTO LABO Consortium" An Association of Companies for Promoting the Digitization of Experiments Related to iPS Cells, etc. — P38

CASE 01

Helping Address Issues Facing the Global Environment and Humanity by Utilizing Our "AW3D" Global High-Resolution 3D Map with the World's Highest Accuracy

Contributions to SDGs

- Developing social infrastructure that is convenient, safe and secure
- Helping build sustainable cities and communities
- Developing infrastructure conducive to disaster management and natural disaster response
- Enabling stable energy procurement and promoting more efficient use of energy
- Realizing a society of health and longevity

If we were to express the concept of NTT DATA's AW3D Global High-Resolution 3D Map in one sentence, it would have to be this: Digitizing the whole earth for use in various simulations.

AW3D is a 3D map service provided jointly by the Remote Sensing Technology Center of Japan and NTT DATA by harnessing satellite imagery processing capabilities accumulated over many years. It uses satellite images from the Advanced Land Observing Satellite "DAICHI" (ALOS) belonging to the Japan Aerospace Exploration Agency (JAXA) as well as from the world's most advanced satellite, operated by American space technology company Maxar Technologies. Using the data sent from ALOS, which has an original image resolution of 2.5 meters, and that sent from Maxar's satellite, which has a resolution of

0.3 meters, NTT DATA processes the data to create 3D maps with a resolution of 5 meters and 0.5 meters, respectively. By combining a series of images sent from the world's most advanced earth observation satellites and the world's leading imagery processing technology, NTT DATA provides 3D data with accuracy equivalent to 1:2500 scale maps as well as image and extracted data. In July 2019, we started offering 2.5-meter mesh data sets of elevation data of global land areas and have completed the whole globe processing in October 2019. Moreover, we have already produced up to 0.5-meter mesh high-resolution data covering Japan and are providing it for any requested area. So far, AW3D has been used to create **maps in 120 countries across the world** for some 1,000 projects in the five short years since inauguration in 2014 inauguration, a fact that testifies to the effectiveness and reliability of AW3D.

It all started with the staggering amount of digital images —3 million in all—taken by ALOS during its operation in the five years after it was launched in 2006. Because turning such an enormous amount of images into data would take a long time, ways to accelerate and automate the process had to be developed. NTT DATA embarked on this challenge and successfully developed innovative technology by combining

improved scalable computation capability, its **multi-view image processing technology** capable of simultaneously processing over 100 images of an area for improved accuracy, with **AI-based image analysis**. This technology has enabled us to provide our customers with high-resolution 3D maps in a speedy manner.

3D map of high-rise buildings in Tokyo's Minato Ward
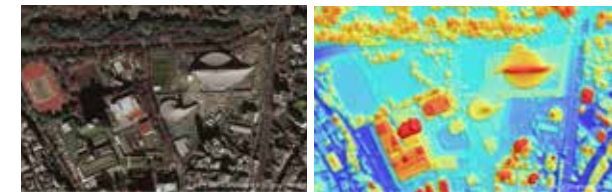
3D map and orthorectified image of the Yoyogi area
© NTT DATA, Included ©Maxar Technologies,Inc.

Used for 3D maps in 120 countries across the world

AW3D is based on satellites capable of taking images with wide area coverage, which allows its users to enjoy greater efficiency and reduce the cost and lead time to about a quarter of that of a conventional method that uses aerial photographs. This feature makes it possible to create 3D maps that are highly practical and easy to use for people all over the world.

Multi-view image processing

Multi-view Stereo Processing technology, developed by NTT DATA, is capable of minimizing errors by using an enormous number of images for each single area taken from various angles by several satellites. This feature enables the creation of 3D maps with errors as small as 0.3 meters at most.

AI-based image analysis

When extracting data of certain objects such as buildings from satellite imagery, using artificial intelligence can speed up the process for a much wider area. For autonomous driving, NTT DATA has focused on developing ways to automatically extract road markings in order to use the data to generate road network information.

CASE01

3D Topographical Data Forms the Foundation of Making Communities Safer and More Convenient
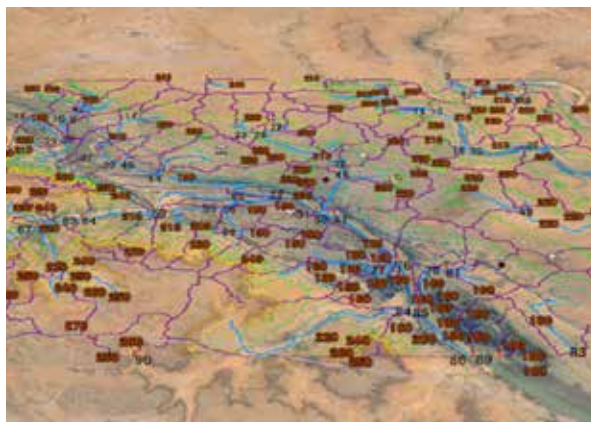
Analyzed image of the virus survey conducted in Niger

The Voice of the Stakeholder

The Japan Aerospace Exploration Agency (JAXA), as a core executive organization that technically supports aerospace development, strives to realize a safe and affluent society through collaboration with various partners. AW3D aims to promote industrial development at a higher level and expand the scope of space utilization through a partnership between JAXA, NTT DATA and RESTEC that allows them to combine and further improve their areas of strength. So far, AW3D has successfully provided solutions for various societal issues, including the provision of natural disaster damage prediction and implementation of water resource surveys. JAXA will continue to strive to make satellite technology a component of social infrastructure through this collaboration with the private sector so as to help create a sustainable society by providing solutions.

Mr. Takeo Tadono
Senior Researcher
Japan Aerospace Exploration Agency (JAXA)

Various application areas

AW3D can be used for a variety of applications including urban development, agriculture, plant construction/maintenance, airports/harbors, electricity, roads/railways, disaster prevention/response and forest/greenery management. The improved accuracy of AW3D has expanded its practical applications for projects in Japan and abroad that require large-scale maps. Even in Japan, where a variety of topographical data has already been created, AW3D has been increasingly used as an alternative to aerial or field surveys due to its advantages, including speed and the newness of information.

There have been numerous cases of AW3D application. In one case, AW3D was used to conduct simulations of radio wave propagation in order to decide where to install base stations of a cellular network. The world is now embracing the fifth-generation mobile communication system (5G), which requires the use of higher frequency radio waves. The higher the frequency of radio waves, the more straight they become. Such straightness may cause even seemingly insignificant objects such as tall trees in a park or house fences to affect the propagation of radio waves. Increasing the accuracy of simulation is needed to address this situation, which can be dramatically improved by overlaying accurately extracted data on buildings and plants onto the area's topographical data.

AW3D has also been used in wind farm construction projects for investigating wind flows from surrounding terrain and for simulating the volume of storm water discharge from mountains or landslide hazards in the event of a heavy downpour.

Helped identify poliovirus transmission routes

One case that has been very memorable for us is a project entitled "Identification of Poliovirus Transmission Routes by Understanding River Flow Paths." The World Health Organization (WHO) regularly samples surface sewage and tests for traces of poliovirus and has chosen to use AW3D to search for more suitable sampling points. The first survey site was Kano in Nigeria, in which analysis was performed on images taken of the site at a 5-meter resolution. The analysis revealed that the actual surface sewage basin was wider by some 2 kilometers to the west and about five times larger in area than originally thought. The reason for WHO to collect sewage samples is to check if they contain the poliovirus in order to prevent polio outbreaks. AW3D has been utilized by WHO to find more appropriate sites to perform the collection.

It is difficult for many developing countries to create 3D maps on their own. NTT DATA's AW3D has been adopted by such countries as a convenient solution for offering their citizens safe and secure living environments by providing national land development, disaster prevention and health services.

Yuki Shinohara
Manager
First Sales Group
Social Innovation Division

Yukie Matsuoka
Assistant Manager
First Sales Group
Social Innovation Division

CASE 02

Automate Routine Business Processes to Make More Time for Creative Tasks with "WinActor®/WinDirector®"

Contributions to SDGs

- Helping to address labor shortages
- Improving productivity
- Preventing/reducing human errors through automation

Robotic Process Automation (**RPA**) is a technology that has increasingly become the focus of attention as a promising solution for promoting workstyle reforms and productivity improvement. It is a solution that allows software robots to take over the execution of routine business processes, many of which are currently done by white-collar workers, thereby automating the tasks and improving work efficiency. NTT DATA's WinActor® is one of the first such solutions introduced to the RPA market in Japan that has been adopted by over 3,000 companies, achieving a high level of customer satisfaction. WinActor® is a 100% made-in-Japan RPA solution developed by NTT Advanced Technology Corporation using technology generated by NTT's laboratories. It learns how to operate as a flow (i.e., scenario) all applications, including the spreadsheet software Excel, browsers and individual business

systems that can be operated from Windows-installed devices to automate the computer operations.

One of the most notable features of WinActor® is that it makes it possible for even non-technical personnel to create automation scenarios. On the scenario creation screen of WinActor®, some 400 "automation components (in a library format)" are pre-installed. For instance, if you want to automate the task sequence of "gather certain data from the host computer, deploy the data in Excel and carry out a predefined calculation, reflect the calculated results on the host computer and send the Excel file to a pre-designated employee," all you need to do to create the scenario is to drag and drop the necessary automation components for the sequence such as "Collect," "Deploy in Excel," "Calculate," "Reflect" and "e-mail" to the Scenario Creation Screen.

You can run WinActor® either on computers or servers. Thus you can start small by using it on a personal computer and, as you find out for yourself how useful the solution is, smoothly convert its use to a larger scale by expanding it to other devices and thereby turn it into a centralized, server-based solution to be used by all employees across the company as

necessary.

If you decide to introduce WinActor® on a large scale to use it for many robots, **WinDirector®**, a robot developed by NTT DATA to control and manage WinActor®, will make all the difference. WinDirector® will enable you to use many WinActors® efficiently and safely as a unified solution.
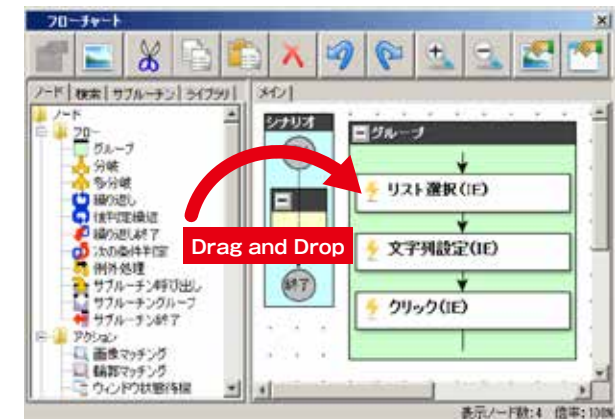
Drag and Drop

WinActor® Screen: Create a scenario easily by using drag and drop

OCR×RPA

NTT DATA started offering optical character recognition (OCR) solutions more than 50 years ago. In recent years, thanks to the advancement of AI-based OCR technology, it has become easy to convert handwritten and other paper-based information to digital formats, resulting in the rapid spread of sophisticated automation combining AI-based OCR and RPA solutions. Our AI-OCR for LGWAN*¹, which was launched in August 2019, has gained a lot of attention as a promising solution for promoting the automation of business processes in local governments.

WinDirector®

As a customer adopts WinActor® and promotes its use across the organization, it becomes increasingly necessary to manage the execution schedule of many scenarios, ensure security including by managing user access rights, and manage the operation status of WinActor®. WinDirector® is a robot that can meet all these needs. WinDirector® helps lower the barriers for businesses to introduce RPA on a large scale, making it easy for them to improve efficiency and productivity across the organization.

Visualization of work processes

When introducing RPA, it is critical to identify to which work processes RPA may be applied. This may sound easy, but identifying such processes accurately is a difficult task. To support this task, NTT DATA has been developing tools for finding routine tasks that can be automated through collaboration with its partners. We carry out this kind of development based always on the needs of frontline workers. This is one reason why WinActor® has been widely embraced by its users.

* WinActor® is a registered trademark of NTT Advanced Technology Corporation.
*1: LGWAN: Local Government Wide Area Network, a network that interconnects local governments across Japan.

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CASE02

A software robot solution not for saving manpower but for making time for creative tasks

Tens of thousands of people have taken the WinActor® operation training course

The Voice of the Stakeholder

Daito Trust Group has adopted NTT DATA's WinActor® across the organization to promote and realize employee workstyle reforms since 2017.

Daito Corporate Service, a special subsidiary company established by Daito Kentaku Group to provide job opportunities to people with disabilities, executes business processes mainly entrusted by other companies across the Group.

Our company hires people with disabilities through collaboration with employment support offices for persons with disabilities. For job seekers who have no experience in program development, we offer practical training in RPA. Those who have successfully completed the training are actively working as members of our RPA team, which was inaugurated in January 2019 to help apply robotic process automation to as many as 700 business processes.

Mr. Koji Sumita
Psychiatric Social Worker
Shared Service Section
Shinagawa Service Department
Daito Corporate Service Co., Ltd.

Overcoming disparities in information technology literacy

Being a solution for automating routine business processes, RPA has been widely regarded as a software designed to cut back on manpower. This perception, however, is wrong. The essence of the solution is the idea that "freeing people from routine manpower-reliant business processes gives them greater scope to exert their creative abilities." Also, by combining RPA and AI, we can help narrow disparities in information technology literacy between people with digital literacy and those without who have been unable to enjoy the benefits of information technology services. For instance, if you combine an AI speaker with RPA, all you need to do is to speak into the AI speaker to make a request, such as "Calculate and settle expenses" or "Reserve a hotel in Tokyo" and WinActor® will take care of the rest. Moreover, by combining a chatbot with RPA, users just have to type their requests into a chat window, such as "Book a seat on the earliest available flight to Fukuoka," which will also be automatically taken care of by WinActor®.

Efforts to address labor shortages and provide a new means of career formation

NTT DATA strives to co-create various services and businesses by coupling its strength based on the 350-strong network of authorized WinActor® dealers with RPA. As one example of such efforts, an authorized dealer whose main business is temporary staffing began providing training to its registered staff on scenario creation skills using WinActor® and dispatching the trained staff to its customers. Once dispatched, these workers perform accounting operations and enable the automation of work tasks at their workplaces, helping to address labor shortages and promote workstyle reforms.

The foundation for the effective utilization of RPA is the implementation of **Business Process Visualization**. This means to visualize (make into a rule) business processes that have become so reliant on experienced employees that no one else understands them. Such visualization can also improve the efficiency of the business processes and make it easier to hand them over to other employees.

Upon building this foundation, we provide people with opportunities to build a "two-way" career by helping them not only pursue traditional career building that aims to improve work skills and but also acquire information technology utilization skills that enable them to use their RPA and other skills for proactively improving business processes. By increasing the number of such people with a two-way career, we can help our customers improve their business processes seamlessly and enable them to devote more time to core and creative tasks.

NTT DATA also focuses on developing RPA experts by putting in place training courses to teach RPA skills as well as an official system to certify RPA skill levels. Recently, we've seen some home-based workers and persons with disabilities successfully improving their employability by acquiring WinActor® skills.

Momoka Kidokoro
RPA Solutions Group
Digital Solution Section
Social Innovation Division

Akiko Muraoka
RPA Solutions Group
Digital Solution Section
Social Innovation Division

CASE 03

Commercial Farming Support Platform that Assists Smart Farming

Contributions to SDGs

- Helping address labor shortages
- Improving productivity
- Promoting automation/efficiency

In April 2019, NTT DATA started making commercially available a commercial **farming assistance platform** (cloud service) to be used exclusively by agricultural organizations including agricultural cooperatives and agricultural corporations.

The platform supports of some of the commercial farming business processes conducted by producers and agricultural organizations, ranging from production planning and confirmation and approval of cultivation records. By having producers input their crop growth status information through smartphones and tablets and making the data accessible by agricultural organizations' personnel, the platform not only visualizes the status of crop growth at the producers' farms but also promotes communication between producers and agricultural organizations in order to improve the quality and efficiency of commercial farming activities. Furthermore, the platform is the official farm management system certified and

recommended by the Japan **GAP** Foundation and can thus be used to implement the Good Agricultural Practices (GAP) and obtain GAP-related certifications.

Producers have long used paper forms to write down and submit production plans or cultivation results to agricultural organizations. With this platform, however, this will be a thing of the past. Just by inputting necessary data using your smartphone or tablet, your forms will be created automatically and become ready for submission to agricultural organizations. It will also make it possible for agricultural organizations' personnel to see the input data any time to check on the observance status of the applicable pesticide use standards and estimate harvest shipping periods and volumes, etc.

When developing this platform, we devoted every possible effort to make the platform easy to use by commercial farmers, whose ICT skills tend to be modest. For this purpose, we involved producers from the planning stage and let them try out the system and give us comments on its usability, while continuing to revise the design based on feedback gathered from them, including their observed behaviors when using the system. As a result of these efforts, we succeeded in developing a system that producers can use easily and that

won't interfere with their daily farming activities. The data input by producers can also be used for their own farming activities.

The platform is offered for an organization-wide flat-rate license fee. The monthly fee for a customer with up to 100 licensed users is 50,000 yen. The platform has already been introduced to and operated by JA Groups in Ibaraki and Kagawa.

Using the platform at a farm

The platform screens on a smartphone

Farming support platform

A farming support platform is a platform aim to realize efficient, high-value-added, labor-saving, and low-cost agricultural production, efficient and sophisticated management and business operations, and visualization of tacit knowledge, know-how, and the like. Agriculture has been marked as part of the Japanese government's growth strategy, and smart agriculture utilizing IT is being promoted as a way to address various issues,

GAP

GAP stands for Good Agricultural Practices, or the management of agricultural production processes, which represent efforts to ensure sustainable food safety, environmental preservation and occupational safety. By recording the efforts and improvement initiatives conducted for these purposes and obtaining government certifications for them, the relevant crops will be approved for government procurement as Safe & Reliable farm produce.

Use fertilizers and pesticides in appropriate places and quantities

NTT DATA also develops solutions for evaluating growth stages of crops by utilizing artificial intelligence and image analysis technology and for identifying the type of pest or weed found on a farm, which have been offered to our customers as optional functions of the platform. By using these solutions, even inexperienced farmers can apply fertilizer or control pests at the proper timing.

CASE03

A Communication Tool that Assists with All Aspects of Farm Management including Downstream and Upstream Processes

Using a drone for farming

The Voice of the Stakeholder

We have been using the platform for some six months now. At the time of adoption, we thought that it would be rather difficult to spread the use of the platform in our area but were nevertheless determined to find ways to promote its use among our member farmers. We shared our thoughts and suggestions with the NTT DATA team, held countless discussions with them and, based on those discussions, they made many improvements to the solution.

We hope to further promote the use of the platform at our member farms and help pass the networks and know-how of our farmers on to future generations so as to keep our area thriving as a sustainable production area for many years to come.

Mr. Hiroshi Ichikawa
Chief
Commercial Farming Planning Promotion Section
Hokota Japan Agricultural Cooperative

Revitalizing Japan's agriculture sector

Agriculture has been designated in Japan's growth strategy as one of the key industries to lead national growth. As such, many efforts are being made to realize smart farming using ICT to address various issues including improving productivity and work efficiency in a bid to increase farmers' incomes across the country. The use of ICT in agriculture, however, has so far been limited. Therefore, there has been a great deal of demand for effective and easy-to-use ICT-based solutions that can be introduced across the agriculture sector.

ICT is characterized by its ability to become more effective and useful as the amount of data expands by the digitization of data previously unavailable in digital form. In the agriculture sector, farmers' experience, know-how and hunches in many areas have not been digitized, and have only been passed down from father to son as family secrets. Introducing ICT into these areas may be able to bring about benefits such as improvement of work efficiency and acceleration of new farmers' skill acquisition.

A mechanism to enable the easy use of various functions

Proclaiming itself a "platform to support commercial farming," the platform aims to offer services beyond the currently available production planning and cultivation result recording functions. NTT DATA aspire to turn it into a true ICT-based platform for all areas of commercial farming including upstream and downstream farming processes. In our efforts to reach this goal, plans are underway to start offering a Sales and Distribution platform in 2021 and a Food and Agriculture platform in 2023.

By using the platform, farmers will become able to try new things including determining the appropriate timing for watering based on the automatically collected crop growth status data and adjusting the timing and quantity of shipments in accordance with the latest price information on farm produce in consumer markets. Nowadays, simply developing systems demands increasingly higher levels of technology, which makes it difficult for us to come up with solutions that are easy to use for producers working on farms. Even under these difficult circumstances, we can support the growth of Japan's agriculture sector by applying NTT DATA Group's vast know-how fostered through developing systems for many types of industry and various lines of business.

In addition to the platform, NTT DATA has started in Minami Soma, Fukushima, a verification testing project in smart farming useful for farm management in which various experiments are conducted. These include one that uses NTT DATA's "airpalette® UTM" drone operation control software package to simultaneously operate several drones capable of receiving highly sophisticated GNSS signals transmitted from a Quasi-Zenith Satellite for identifying the growth status of crops and **applying fertilizers or pesticides in appropriate places and in just the right amount**. NTT DATA believe that the findings from these experiments can also be used to raise farming productivity in developing countries and thus contribute to improving global food security.

Hidetoshi Ookawa
Manager, Food Business Planning Group, Third Financial Sector

CASE 04

"CAFIS"
A Platform that Provides Continuous Support for Cashless Payments in Japan, 24 Hours a Day, 365 Days a Year

Contributions to SDGs

- Developing social infrastructure that is convenient, safe and secure
- Helping reduce environmental impact

CAFIS (Credit and Finance Information Service) is a comprehensive payment platform that relays transactions linking stores and **public payees** that accept credit cards with credit card companies and financial institutions. Foreseeing the imminent expansion of Japan's credit card market, NTT DATA began offering this service in 1984. It has now grown to become "infrastructure" for cashless payments in Japan.

For the 35 years since its inauguration, CAFIS has responded to emerging demands by offering a variety of cashless payment-related support services and expanding its solution portfolio to keep pace with the diversification of methods offered in a cashless economy. Currently, we offer over 30 CAFIS-based services. Recently, we started offering services such as CAFIS Arch, a cloud-based payment platform, CAFIS Pitt, a smartphone-based cashless payment platform, and Code-based Payment Gateway (GW), a widely publicized service for unifying settlement processes of many different code-based payments.

CAFIS Arch is a cloud-based comprehensive payment platform capable of processing payments by credit cards, debit cards, various electronic money services, contactless payment transaction using IC chips and payments by inbound travelers using payment services offered in their own countries. It also supports payments by the new, widely publicized JPQR, an unified barcode and QR code system. CAFIS Pitt is a smartphone-based payment platform that can be easily installed inside credit card member companies/stores' smartphone applications. Like the ".Pay"*1 service offered by TOKYU CORPORATION and NTT DATA, CAFIS Pitt is a white-label service that can be rebranded by credit card member companies/stores to create their own original payment services.

For each CAFIS service, we have obtained security certifications from organizations such as the Information Security Management System (ISMS) and the Payment Card Industry Data Security Standard (PCI DSS), global standard for payment card companies, in order to allow credit card member companies/stores to adopt a variety of payment methods **safely and securely**.

*1 ".Pay" is a credit card payment solution offered by Tokyu Corporation and NTT DATA since April 2018. It's the world's first cardless payment solution that can be used both in online and physical stores.

CAFIS in use

Supporting public institutions that collect taxes/fees

Among all public fee/tax payment services available today, CAFIS is the only platform that supports three payment methods of (1) direct debit from savings account, (2) payment by requested bank transfer and (3) credit card payment. Line Pay has now been added to its portfolio of services, making the platform all the more convenient.

Offering services for 35 years since its inauguration

Thirty-five years after its inception, CAFIS now boasts an extensive network connecting all credit companies and financial institutions in Japan and stably processes as many as 800 million transactions a month via 850,000 terminals for shared use, POS terminals in credit card member stores, and online shops, working 24 hours a day, 365 days a year.

Ensuring safe and secure introduction

In 2012, CAFIS adopted a dual-center structure by establishing data centers in both Tokyo and Osaka. Based on this structure, it offers uninterrupted service and has successfully ensured service continuity in times of major disaster. It has also introduced a multi-carrier format to its networks to secure multiplicity and redundancy.

CASE04

"Beyond the Payments"—Providing Services to Realize a World Where Consumers Can Enjoy Safe and Stress-free Shopping Anywhere

Electronic signature enables paperless payment

CAFIS terminal in use

Leading the popularization of cashless payments

In the beginning of 1980s, at the dawn of the history of credit cards in Japan, all credit card companies had their own terminals for credit card processing. Therefore, if shops wanted to accept several different credit cards, they had to have separate terminals for each of them. Furthermore, credit card companies and processing terminals were connected by telephone line, placing a large economic burden in the form of high connection charges on credit card member stores located outside the Tokyo area. What's worse, the processing terminals in those days did not support Point of Sales (POS) systems and there was no infrastructure to relay credit data between processing centers of major companies that were using POS and processing centers of credit card companies.

To solve these issues, CAFIS was launched as a shared-use service that relays credit information by interconnecting credit card terminals, stores and credit card companies' processing centers. CAFIS dramatically improved the convenience of credit card use in Japan, a very cash-oriented country, leading to the popularization of ensuing cashless payment services across the nation.

The popularization of CAFIS also helps enhance internet governance and the value of data in today's information-oriented society, eventually contributing to global environment preservation. Spreading the use of the payment platform, which is safe, speedy and lightweight, will undoubtedly ensure governance and improve the value of data. It will also provide consumers and store clerks with smooth and convenient shopping experiences, resulting in the stimulation of consumer spending.

Introducing more services to address future issues

CAFIS also aims to mitigate the environmental burden on society as a whole through its portfolio of services. For instance, the CAFIS Payment Slip Storage Service has eliminated the issuance of paper-based payment slips for customers to sign, thus making it possible to complete a direct debit procedure without using paper or a seal. Also, with CAFIS Arch, we succeeded in substantially reducing the use of paper, movement of goods and mobilization of people through measures such as adopting cloud computing and improving the efficiency of business processes. Based on our estimate, annual CO_2 emissions can be reduced by 53% following the adoption of CAFIS services.

NTT DATA has developed information systems for many types of industry and various lines of business. The comprehensive findings we have gained from past projects can be promptly utilized for addressing new issues and building the foundation for developing future systems from the customer's perspective. Under the slogan of "Beyond The Payments" and striving to offer additional services other than payment solutions, NTT DATA aims to turn the world into a place where anyone can enjoy safe and stress-free shopping anywhere, whenever they feel like shopping and making payments.

Maki Fukushima
Deputy Manager
Business Promotion Development Office
Cards & Payments Services Division

Makoto Tomita
Manager
Arch Solution Group
Cards & Payments Services Division

CASE 05

AI Diagnosis Support Solutions

Contributions to SDGs

- Realizing a society of health and longevity
- Developing social infrastructure that is convenient, safe and secure
- Helping to address labor shortages

Growing demands for image-based diagnostic assistance using AI

The demand for medical imaging-based diagnosis using X-rays, computer tomography (CT) and magnetic resonance imaging (MRI) has been increasing year by year. Image-based diagnosis has also been regarded as an effective tool for detecting many diseases including cancer at an early, treatable stage and is thus expected to bring a significant advancement to preventive medicine if some kind of mechanism is established for allowing people to periodically receive detailed medical screenings using CT or MRI. However, making a medical image-based diagnosis is a time-consuming task for which a radiologist must check thousands of images. With the pervasive **shortage of radiologists** seen across the world today, it is becoming increasingly challenging for doctors to make prompt diagnosis. To help resolve this societal issue, we decided to work on the development of an AI-based system to assist medical image-based diagnosis.

At the start of the project, we conducted validation of an AI-based diagnosis tool for emphysema using CT imaging at Deenanath Mangeshkar Hospital, an 800-bed hospital in Pune, India during the spring of 2018. We discovered that a broader range of emphysema cases were detected by the AI-based diagnosis tool than by doctors and that the AI-based diagnosis tool could also identify future risks.

Features of NTT DATA's image-based medical diagnosis assistance solution using AI detecting all abnormalities

During the validation process at Deenanath Mangeshkar Hospital a new point of view on the single target disease AI-based diagnosis tool was raised by the radiologists. They pointed out that diagnosis for diseases other than emphysema would still require examination by a radiologist and, therefore, the AI-based diagnosis tool would not contribute significantly to the improvement of diagnosis efficiency. It was also found that, in the false positive cases detected by the AI-based diagnosis tool, the patients had pulmonary tuberculosis, a disease rarely seen in developed countries. These findings revealed two issues: (1) AI-based diagnosis would not help shorten time to diagnosis insofar as it is targeted at specific diseases; and (2)

Example of abnormality (stone) detected by NTT DATA AI medical imaging diagnosis support solution

Results of the demonstration experiment conducted from March 2019 in collaboration with University of Miyazaki Hospital
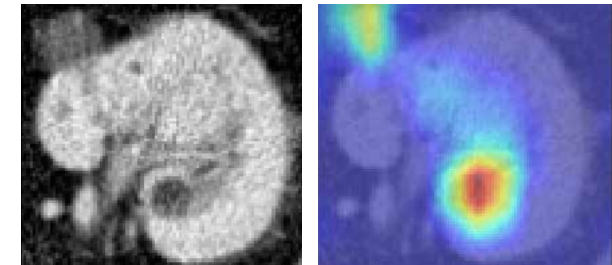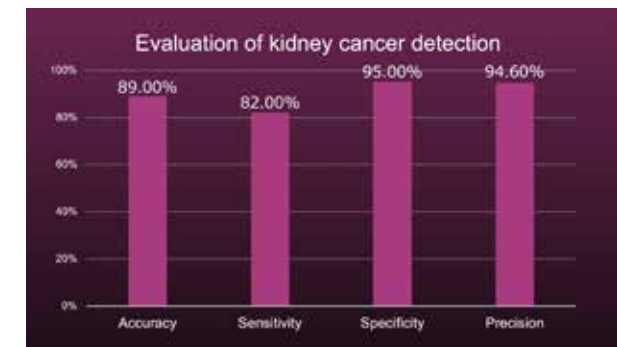
Shortage of Radiologists

As CT and MRI technologies advance, the number of medical images taken for diagnosis has continued to increase. Despite this, the number of radiologists has not grown, resulting in the current situation in which Japanese society is facing a serious shortage of radiologists, with only 0.35 radiologists per 1 million people and 0.085 radiologists for each CT or MRI scanner in Japan.

Image-based medical diagnosis assistance using AI

Most of the AI-based medical solutions currently being developed by AI companies are specialized in certain diseases and aim to prevent serious disease symptoms from being overlooked. For improving the efficiency of diagnosis, it will be vital to promote efforts to utilize AI for assisting diagnosis not only of serious diseases but of health conditions in general.

Learning data

The source of learning for artificial intelligence is data. Therefore, for developing AI that will detect various abnormalities it is necessary to prepare data that includes information on all the relevant abnormalities. We need to collect data from a variety of hospitals, as the types of disease commonly treated are also different by hospital.

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CASE05

Providing More Accurate and Diverse Services to Improve Diagnostic Efficiency

misdiagnosis could occur due to the differences in diseases commonly seen among patients in different countries. We therefor decided to start the development of an **image-based medical diagnosis assistance solution using AI** that can address these issues. In developing the solution we collected data from several countries including the U.S. and Japan in order to achieve the completeness of abnormality-related data. This was also important in order to have **learning data** that is not affected by a difference in the prevalence of diseases by country and in image processing technology by device. Combining this data with AI technologies we succeeded in developing the solution.

The solution is equipped with three functions: (1) detecting abnormalities; (2) discovering the locations of abnormalities; and (3) tagging the discovered abnormalities with disease labels.

This solution has also been proven to possess general-purpose versatility that can be used globally, in a demonstration experiment conducted in collaboration with the Miyazaki

The Voice of the Stakeholder

NTT DATA's AI-based solution is a truly unique and innovative tool in that it does not only target specific diseases. At times, doctors are required to diagnose cases that are outside their areas of specialization. In these situations, a tool that provides us with alerts covering all kinds of abnormalities is very useful. It can also play a significant role in the triaging of patients with acute medical conditions. I feel privileged to have been given the opportunity to work with NTT DATA to help promote their R&D efforts and contribute to the advancement of medicine.

Dr. George Shih
Co-founder of MD.ai
Associate Professor /Certified Radiologist
Cornell University

University Hospital from March to November 2019. Specifically, the experiment aimed to verify that the solution created with learning data accumulated in the U.S. could also detect kidney abnormalities in patients in Japan in the same way. According to the experiment results, the sensitivity and specificity of abnormality detection were found to be very high. Especially among cancer patients, the sensitivity and the specificity were as high as 82.4% and 95.3%, respectively, accuracy levels that were roughly in line with the test results from the U.S. patient group.

In today's global society, doctors have more and more occasions of attending patients from other countries. Our solution features a versatility that enables it to be quickly adopted for diagnosis purposes without being limited by patient nationality or area of residence. As such, the importance of the solution is expected to increase as society continues to become increasingly global.

Aiming to provide new social and medical services based on the image-based medical diagnosis assistance using AI

NTT DATA Services provides some 1,100 medical institutions in North America and surrounding areas with the Unified Clinical Archive (UCA), a cloud-based medical imaging archive solution.These institutions include various types of medical service providers ranging from clinics and university hospitals to medical imaging centers, each of these having needs characteristic to their business models.

Under these circumstances, discussions are underway regarding the possibility of offering the solution in ways that emphasize its prioritization function that can have various applications. For instance, if the AI is integrated with the solution, determining the diagnosis priority of patients based on the severity of their medical conditions, doctors will be able to diagnose them in order of urgency. This practice is likely to improve the patients' recovery or survival rates and may thus

provide benefits to both patients and doctors. Furthermore, by identifying points of abnormality beforehand, a radiologist whose area of specialization is appropriate for the case can be assigned, enabling the prompt provision of accurate diagnosis. For health checkups, if we can offer the function for discerning patients who are healthy from those who need to be examined more carefully, the solution will help establish a mechanism for efficiently providing advanced medical screening services using CT or MRI scans, which is expected to bring significant benefits in terms of preventive medicine.

To contribute to such new societal initiatives including the promotion of preventive medicine, we are planning to start offering a service to provide customers with AI-based diagnosis support tools by harnessing our experiences obtained through the years of providing UCA to hundreds of customers.

NTT DATA will strive to offer the solution to doctors and medical professionals not only in the U.S. but also in more countries across the world in order to relieve their burden and promote the health of people everywhere.

Takashi Okada
Manager
Advanced AI Technology Group
Evolutional IT Center
Research and Development
Headquarters

Daria-Antonia Bunu
Advanced AI Technology Group
Evolutional IT Center
Research and Development
Headquarters

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CASE 06

"AMLAD®"
A Digital Archive Application that Helps Develop a Platform for Preserving Digitized Historical Documents and Making Them Available to the Public

Contributions to SDGs

- Helping protect and enhance preservation of cultural and natural heritage sites across the world
- Enabling the provision of quality education
- Developing social infrastructure that is convenient, safe and secure

In March 2018, NTT DATA completed the digitization of 3,000 handwritten documents of historical importance owned by the Vatican Library (Biblioteca Apostolica Vaticana). It also developed DigiVatLib, a platform to allow the Library to preserve the digitized images of the documents and make them available to the public, by using AMLAD®, NTT DATA's digital archive solution. **The Vatican Library** was established in 1451, or around the middle of the 15th century, by Pope Nicholas V. The Library has a massive collection comprising some 1.1 million works including numerous historical books, documents and illuminated manuscripts, some of which are more than 2,500 years old. The collection includes, among others, some 8,200 pieces of rare, one-of-a-kind handwritten manuscripts or codices such as the Codex Vaticanus.

In the past, the Vatican was torn between two conflicting goals it wished to achieve: addressing the critical need to preserve the Library's rare materials and making them

The Vatican Library

This project at the Vatican Library aims to digitize the Library's entire collection comprising some 80,000 codices, amounting to about 40 million pages. The total volume of the data is expected to be a whopping 45 petabytes.

available to the public as important assets representing the history of mankind so that people across the world could read them. To solve this dilemma, the Vatican decided to digitize the manuscripts and chose to adopt AMLAD® for the task.

Kicking off in March 2014, the project involved us scanning 3,000 manuscripts one page at a time using a scanner specially developed for this purpose. Digitized images of the pages were then converted into formats suitable for long-term storage and registered in DigiVatLib together with their metadata. NTT DATA completed all of the planned digitization processes in March 2018 and now carries out maintenance work for DigiVatLib.

Many libraries, museums and archives around the world have recently taken an interest in this project at the Vatican Library and have contacted us to inquire about the possibility of creating their own digital archives with AMLAD®.

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Website of the Vatican Library's Digital Archive

AMLAD® helps enhance the value of digital assets

AMLAD® is a digital archive service capable of providing a mechanism for storing all data formats including text, image, video and audio and enabling users to easily search and view the stored data using their own devices such as personal computers and smartphones. NTT DATA has incorporated many functions into AMLAD®, including not only multi-directional search but also various data linkage methods and flexible administrative functions, by utilizing its cutting-edge archive technologies fostered through the project it completed for the National Diet Library in Japan.

The Vatican Library

An example of the manuscripts to be digitized

©Biblioteca Apostolica Vaticana
Digitization work in progress

Message from the CEO | Company Data | Sustainability in the NTT DATA Group | Efforts to Make Social Contributions through Businesses | Social | Environment | Governance | GRI Standards

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CASE 07

Projects to Verify the Feasibility of Predicting the Onset of Lifestyle-related Diseasesby Using AI-related Technologies

Contributions to SDGs

- Realizing a society of health and longevity
- Developing social infrastructure that is convenient, safe and secure

Many initiatives have been implemented in Japan for disease prevention and health promotion as part of efforts to extend the years of healthy life of its citizens. Lifestyle-related diseases in particular have become a major social issue that brings with it an increase in national health spending and a decline in employee productivity for business organizations. This situation makes it necessary for the country to improve the lifestyle habits of its citizens and grasp their health risks in order to prevent the onset of lifestyle-related diseases.

As part of such efforts, NTT DATA and NTT are conducting an assessment project that uses AI to predict the onset risk of lifestyle-related diseases (i.e., diabetes, hypertension and dyslipidemia) in order to allow insurance companies to utilize the resultant data. This project aims to verify the effectiveness of prediction technologies so that insurance companies can develop new plans and products, assess insurance applicants and help improve the health of their policy holders.

Since its inauguration in 2018, this project has been evaluating the feasibility of applying prediction technologies to the stages

A method enabling highly accurate analysis

What makes the highly accurate prediction possible is a technique called "Learning to Rank." Instead of the traditional learning method based on the classifications of "pre-onset" and "post-onset," the project has adopted the Learning to Rank technique to compare disease onset probabilities and made it possible to use the data of pre-onset persons whose available data cover only short time frames.
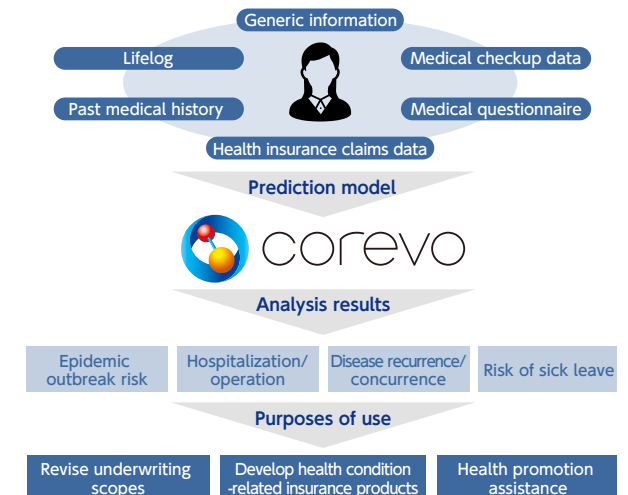
of product development, underwriting assessment and policy holders' health promotion among many insurance companies. Specifically, the project has focused on identifying issues for purposes such as "finding items and standards that are necessary to understand health risks" and "promoting policy holders' health." For instance, in analyzing medical checkup data, it used to be difficult to conduct highly accurate data analysis when using data with blanks and omissions taken from patients who only receive medical checkups irregularly, data on a limited period of time from patients who only have medical checkup data for that period, or the small amounts of sample data available on the onset of rare diseases. To address this situation, we developed as a part of corevo®, NTT's AI-related technology portfolio, **a method for conducting highly accurate analysis** even with uneven and scant data, making it possible to predict the future onset probability of lifestyle-related diseases based on the data from medical checkups. This prediction technology has been adopted for the medical checkup data analysis service offered to selected customers using Health Data Bank, NTT DATA's cloud-based health management solution, and has been achieving high prediction accuracy. Especially for diabetes, one of the lifestyle-related diseases, we have achieved the high prediction accuracy of 90%.

The projects will also benefit insurance companies. It has been the usual practice for insurers to develop products and assess insurance applicants based on the calculation results of future onset risk of diseases, but the adoption of NTT's disease onset risk prediction technology will change this practice altogether. Insurers will no longer need to collect and analyze a vast amount of data from medical checkups and health insurance claims or to take measures to deal with sensitive personal information as stipulated in the amended Act on the Protection of Personal Information.

NTT DATA is planning to start providing its prediction technologies as commercial services in 2020, with a view to continuing its efforts including the development of a disease onset prediction model for senior citizens and an individual contract-based data analysis service.

NTT's AI-related technology portfolio, "corevo®"

"corevo®" is the name given to the portfolio of efforts by NTT that utilize AI developed through a series of its R&D initiatives. The name "corevo" is coined from the term "co-revolution." The corevo® portfolio is comprised of four kinds of AIs: (1) Agent-AI that uses cues in information contained in human outputs to grasp people's intentions and emotions; (2) Heart-Touching-AI that deciphers the mental and bodily responses of humans to understand their unconscious mind, cognition and instincts; (3) Ambient-AI that deciphers humans, objects and environments and instantly predicts and controls them; and (4) Network-AI that optimizes the entire social system by connecting several AIs. By promoting the cross-sectional use of this portfolio, we can help create new social services, businesses and values.

Generic information · Lifelog · Medical checkup data · Past medical history · Medical questionnaire · Health insurance claims data

Prediction model

corevo

Analysis results

Epidemic outbreak risk | Hospitalization/operation | Disease recurrence/concurrence | Risk of sick leave

Purposes of use

Revise underwriting scopes | Develop health condition-related insurance products | Health promotion assistance

CASE 08

"Mitaka Data Center EAST"
A Data Center that Has One of the Largest and Most Advanced Features in Japan While Achieving Excellent Environmental Performance

Contributions to SDGs

- Helping reduce environmental impact
- Enabling stable energy procurement and promoting more efficient use of energy
- Developing social infrastructure that is convenient, safe and secure

In April 2018, NTT DATA began operating Mitaka Data Center EAST, its 16th data center in Japan. The Center is equipped with functions required to serve as the foundation for enabling the **digital transformation** of all companies in any type of industry and any business category, including the gathering and accumulation of data; computerization of data and adding value to it; and promotion of collaboration for co-creation.

One of the most notable features of Mitaka Data Center EAST is its excellent environmental performance. Servers installed at data centers usually give off a lot of heat. Compressors and cooling systems in the centers needed to mitigate the heat consume vast amounts of energy. In Mitaka Data Center EAST, however, we succeeded in reducing energy consumption by actively using cool outside air.

The Center has a unique physical form in which the

building's perimeter length increases in proportion to the floor height. This shape was the result of adopting the "through-the-wall air-conditioning system using hot aisle capping," a system that enables efficient cooling of the hot servers by taking in cool outside air from underfloor spaces. In this system, the periphery surface of the building provides air passages, which makes it easier to let the heated air out in higher floors as the floor's periphery surface increases in proportion to its height.
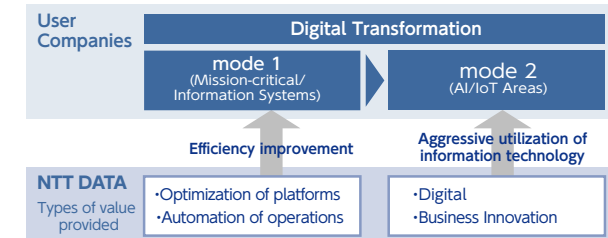
On the Center's roof, solar power panels with a total generation capacity of 90 kW are installed, helping reduce CO_2 emissions by 28,528 kg per year. The reduction is equivalent to an annual reduction in oil consumption of 353,609 liters.

The Center aims to achieve a PUE (Power Usage Effectiveness of the Center, calculated by dividing the Center's power consumption by the power consumed by its IT devices) of below 1.3 through taking various measures. Data centers in Japan typically have a PUE of 1.87. Thus, if we succeeded in achieving a PUE of below 1.3, it is expected to bring about significant energy saving effects, equivalent to a reduction in electricity bills worth some 1 billion yen a year. By cutting back on the electricity expenses for its air-conditioning systems, the Center contributes not only to the protection of environment but also to the reduction of customers' rack ownership costs.

As these environmentally friendly features were regarded favorably in the process of acquiring LEED certification, a green building rating system overseen by the U.S. Green Building Council, Mitaka Data Center EAST in September 2018 obtained the latest version of the LEED Gold certification, becoming the first organization in the data center category in Japan to do so.

Digital transformation

Within the NTT DATA Group, the term "digital transformation" is defined as "promoting the use of digital in ways that contribute to our customers' businesses." Digital environments surrounding businesses are increasingly required to develop further and proceed to the next level because of market changes brought about by the drastic advancements in AI technology as well as the rapid increase in the number of IoT devices in today's world.

Mitaka Data Center EAST

- Gross floor space: 37,650 m²
- Number of installed rack units: Up to 5,600 units
- Structure: By installing horizontal seismic isolation devices and vertical vibration control dampers in addition to the bird cage structure of its outer periphery and truss structure over the roof, its horizontal and vertical accelerations are decreased by some 80% and 40%, respectively.
- Power supply: Equipped with emergency power generators that can operate for 72 hours without refueling
- Electricity usage per rack unit: Capable of supporting up to 20 KVA per rack unit
- Network: Multi-carrier compatible networks pulled in through service tunnels (dedicated underground tunnels)
- Security: Conforming to FISC and ISO 27001 guidelines

User Companies	Digital Transformation	
	mode 1 (Mission-critical/Information Systems)	mode 2 (AI/IoT Areas)
	Efficiency improvement	Aggressive utilization of information technology
NTT DATA Types of value provided	·Optimization of platforms ·Automation of operations	·Digital ·Business Innovation

Conceptual Diagram for Realizing Digital Transformation

Message from the CEO | Company Data | Sustainability in the NTT DATA Group | **Efforts to Make Social Contributions through Businesses** | Social | Environment | Governance | GRI Standards

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CASE 09

Aiming to Foster Culture of Innovation and Resolve Societal Issues through "Global Hackathon"

Contributions to SDGs

- Promoting sustainable agriculture
- Helping build sustainable cities and communities
- Developing social infrastructure that is convenient, safe and secure
- Helping to address labor shortages

The NTT DATA Group has some 123,900 employees all over the world. To provide our employees with a chance to collaborate, we hold a group-wide annual event called the "Global Hackathon" in which employees across the world share global societal issues and work together to devise solutions for them. Since its inauguration in 2017, the event has provided opportunities for our Group employees to actively learn about advanced technologies and nurtured a spirit of innovation among them through promoting exchange between technical specialists and the sharing of ideas. The specialists who become winners in the qualifying rounds held in different locations around the world get together for the final round of this technical competition, in which they are presented with some real global issues and collaborate to devise software-based solutions for the issues within the assigned time of 27 hours.

At the first meeting of the Global Hackathon, itelligence

Global hunger predicted for the year 2050

The world's population is expected to grow to 10 billion by 2050, bringing about an increase in the global demand for food of up to 70%. "Farmbot" is a solution envisaged to address this dramatic increase in food demand by enhancing the cultivation of vegetables in urban areas and coming up with optimal ways of distributing crops.

AG from Germany won the first prize for the "Farmbot" that they proposed as a solution for addressing the issue of **global hunger for 2050 expected to be brought about by the projected population growth.** Then, in 2018, in what became the second session of the event, NTT DATA Deutschland GmbH became the champion for its idea of "Disaster Relief Support using Geographic Information including Satellite Imagery." Winners of the events were given rewards including investment opportunities in research and development projects and support for promoting cooperation with relevant organizations in an effort to help commercialize their proposed solutions and spread them across the world.

"Farmbot," the proposal that won the first prize at the first event, is a solution combining a variety of plant cultivation management and fertilization control systems that supports the realization of smart agriculture with the use of the "Bot," a cultivation box developed by FarmBot in Germany. By connecting the data about vegetables being cultivated in Bots all over the world through the Farmbot network, the solution offers advice on various issues including the optimal places to distribute the harvested produce and ways of developing distribution networks for that purpose.

For "Disaster Relief Support using Geographic Information including Satellite Imagery," the winner of the second Global Hackathon, the team developed software to enable artificial intelligence to develop rescue measures and formulate the optimal operation strategies of relief teams based on satellite imagery of the affected areas and images taken by cameras installed in the areas while supporting the prompt payment of insurance premiums.

Focusing on the themes of AI and SDGs in the second session

In the first Global Hackathon held in 2017, 270 teams from across the world participated in the qualifying rounds. Eventually, 14 teams won the qualifying competitions and made it to the final round in Barcelona, Spain. For the second event held in 2018 under the themes of artificial intelligence and the Sustainable Development Goals (SDGs), 330 teams from around the world joined the qualifying competitions, from which nine teams advanced to the final round in Munich, Germany.

Participants in the final round of the second Global Hackathon

Teams discussing the assigned issues in the second Global Hackathon

BOT: Culture Box by Farmbot

CASE 10

"Immigration Control System"
for Improving Convenience for Travelers and Efficiency
of Immigration Procedures Using Biometric Authentication

Contributions to SDGs

- Developing social infrastructure that is convenient, safe and secure
- Helping build sustainable cities and communities

everis Group (hereinafter, "everis"), NTT DATA's affiliated company in Spain, received an order from Aena SME S.A. (hereinafter, "AENA"), an airport service operator in Spain, for a project to introduce its Biometric Authentication-based Automatic Immigration Control System at four airports in the country. By July 2018, everis had completed the installation of 220 cutting-edge automatic gates at the airports and began operating them in sequence. This is the first project in Spain to introduce an automatic immigration system using biometric authentication. Going forward, the project is set to introduce another 81 automatic gates to three domestic airports including Seville Airport and start operating them by December 2019.

The system has so far been introduced to the four airports of Barcelona-El Prat Airport, Alicante-Elche Airport, Palma de Mallorca Airport and Menorca Airport. Of these airports, the largest number of 80 automatic gates were installed at Palma de Mallorca Airport, a project representing one of the largest installations of such gates at an airport anywhere in Spain.

Airports in Spain are said to be used by a total of **249 million people** annually. The introduction of this automatic immigration control system to the airports helps to improve convenience for airport users, make airport operations more efficient, and enhance security by reducing the time spent on immigration procedures down to 12 seconds per person through the prompt verification of travelers' identities by the use of advanced collation techniques for verifying the personal information recorded in passports and other documents, together with face and fingerprint-based biometric authentication methods.

The adoption of the system has allowed the Spanish police to change the way in which they provided border security and focus on immigration procedures for special cases that cannot pass through the automatic immigration control system (e.g., families with children, travelers requiring special visas). This system is also linked with the Schengen Information System, a database of security-related information including data on people who are sought in relation to criminal activities, and the Visa Information System, a database containing information on persons applying for visas, contributing the realization of advanced security through, for instance, helping to prevent criminals from fleeing their countries as well as to find terrorists.

249 million people per year

According to OECD data, Spain is annually visited by a total of 82 million inbound tourists, who spend a total of 87 billion euro (11 trillion yen) while in the country. Tourism accounted for 11% of Spain's GDP in 2016, the biggest ratio among the world's major economies. (For instance, in Japan, tourism accounted for 1.9% of GDP in 2016.) Prompted by the fact that Spanish airports are used annually by as many as 249 million people in total, Spain has been required to make its immigration procedures faster and more efficient to further improve the potential of its tourism industry.

The automatic immigration control system also enables self-boarding

With the automatic immigration control system delivered by everis, travelers will first need to pre-register at check-in counters at unmanned kiosks as they arrive at the airport. As soon as they finish the pre-registration process, the personal information recorded in their passport as well as their facial and fingerprint data will be sent to AENA's Biometric ID Manager. After that, as the travelers approach the security filter that lets them go through to boarding areas, several facial photos of them will be taken automatically and collated with the records kept in the ID Manager. When their identities are verified, the gate will automatically open to let them in. These processes will be conducted again at the boarding gates, allowing them to board their flights without having their boarding passes checked.

Menorca Airport

Biometric Authentication Gates at Menorca Airport

A video screen for biometric authentication

CASE 11

"Converting CO$_2$ into Renewable Energy" — NTT DATA Contributes to Environmental Impact Reduction through Participating in an EU-led Project

Contributions to SDGs

- Helping reduce environmental impact
- Enabling stable energy procurement and promoting more efficient use of energy
- Helping build sustainable cities and communities

Businesses are required to fulfill the important missions of developing environmental solutions and promoting their use in order to reduce the impact they have on the environment. To this end, i-deals, a subsidiary of everis Group, NTT DATA's group company in Spain, has participated in the **MefCO$_2$ project** supported by the European Commission (EC) through Horizon 2020, the EC-led framework for research and development inaugurated to promote pan-European research and innovative development projects, and has made significant contributions to the project's outcomes.

MefCO$_2$ project

MefCO$_2$ is a consortium in which nine organizations from seven countries participate. The names of the organizations and their specific responsibilities are as follows:
▶RWE Power(Germany): Construction and operation of the plant▶Carbon Recycling International (Iceland): Provision of methanol units▶Mitsubishi Hitachi Power Systems Europe (Germany): Provision of system integration services and CO$_2$ conditioning units▶Hydrogenics Europe (Belgium): Development of technology for electrolytic cells▶Cardiff Catalysis Institute (U.K.): Research on catalyst synthesis▶Slovenia Scientific Institutes (Slovenia): Verification of catalysts and reaction engineering▶University of Genoa (Italy): Thermoeconomic analysis and process optimization▶University of Duisburg-Essen (Germany): Simulation of processes▶i-deals (Spain): Management and coordination of the project

The MefCO$_2$ project aims to verify the technology—and its financial feasibility—for mixing carbon dioxide emitted from factories and power plants with hydrogen generated during the process of producing renewable energy to convert the mixture into new renewable fuels such as methanol or base chemicals that can be used for multiple purposes. The EU has been faced with two major needs: promoting decarbonization of its energy and industrial sectors and increasing the ratio of renewable energy use in its energy consumption. As a measure to reduce CO$_2$ emissions, carbon dioxide capture and storage (CCS), a process of capturing carbon dioxide emitted into the atmosphere and storing it underground, used to be regarded as a promising solution. However, as it turned out that the process entails significant costs and is thus difficult to be put to commercial use, processes that capture carbon dioxide and use it for other purposes instead of storing it underground have started to attract public attention as alternative solutions.

The technologies developed for the project have been demonstrated to have the capability of generating 1 ton of methanol a day and capturing 1.5 tons of carbon dioxide a day in the pilot plant built in Germany. Converting this amount on an annual basis gives about 400 tons a year. In the future, the company plans to expand the amount to some 50,000 tons a year.

For the MefCO$_2$ project, i-deals took up the role of managing and coordinating the entire project by drawing up business plans and following up on their progress, serving as a negotiator-cum-coordinator with the EU's relevant secretariats, and providing guidance on administrative procedures and financial issues. Being known as a technological broker, i-deals boasts a lot of experience and know-how on linking

administrative agencies, businesses and technical specialists and supporting the introduction of energy-related technical innovations that can make significant contributions to society.

Combined with gasoline, methanol generated from the process will help reduce emissions of hazardous substances such as benzene and hexane. Methanol also has positive effects including emitting less particulate matter and nitrogen oxide compared with diesel, another unblended fuel. Methanol is also expected to have great potential for commercialization as it is widely used as an intermediate material for shampoos, textile fibers and plastics.

Developing new catalysts at the pilot plant

The project succeeded in significantly improving the generative reaction for hydrogen through measures such as improving the electrolyte membrane in the hydrogen generation process. In the methanol generation process, the project also successfully developed a new catalyst with a drastically improved conversion rate.
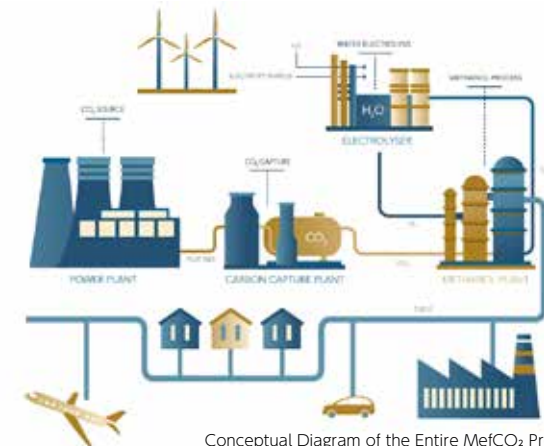
Conceptual Diagram of the Entire MefCO$_2$ Project

CASE 12

"COTO LABO Consortium"
An Association of Companies for Promoting the Digitization of Experiments Related to iPS Cells, etc.

Contributions to SDGs

- Realizing a society of health and longevity
- Developing social infrastructure that is convenient, safe and secure

NTT DATA has been stepping up its efforts toward the enhanced utilization of IoT and AI in the field of life sciences.

As a part of these efforts, in November 2018, we concluded a capital and business tie-up agreement with iPS PORTAL, Inc. in Kyoto, which allowed us to acquire the company's shares through third party allotment. iPS PORTAL is the only company in Japan able to generate iPS cells from blood for commercial use and promotes iPS cells-related businesses in collaboration with partners that include universities, pharmaceutical companies and equipment manufacturers.
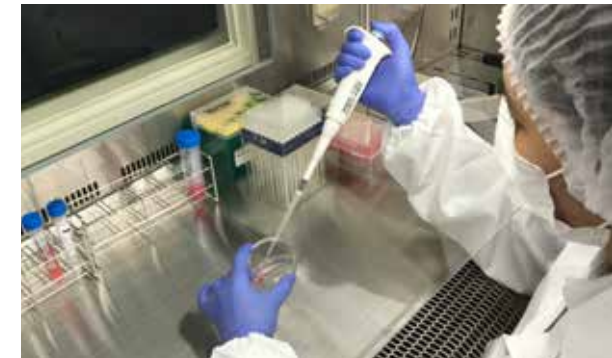
NTT DATA boasts a proven track record of utilizing data for projects in the fields of new drug development and healthcare and has technologies that utilize IoT and AI analytics. Going forward, we will strive to add new value to iPS cells by utilizing our IoT and AI technologies in research undertaken in life science fields such as new drug development and regenerative medicine.

In May 2019, NTT DATA and seven other companies inaugurated the **COTO LABO Consortium** to provide laboratories for projects that use iPS cells (COTO LABO is an abbreviation for **"Communication Tool Oriented/Originated LABOratory Consortium"**). The Consortium aims to develop next-generation laboratories that are capable of improving the repeatability of experiments and efficiency of cell culture and other processes by promoting the centralized management and utilization of digitized scientific data including actions in research activities and analysis results in life science fields such as new drug development and regenerative medicine.

By integrating advanced technologies and techniques developed and held by leading companies in their respective fields into one laboratory system, the Consortium strives to offer new value that will help enhance the transparency, repeatability and efficiency of experiments. For this Consortium, NTT DATA offers all tools and services required for its IT infrastructure including platforms for gathering information from devices and building equipment provided by experiment equipment manufacturers as well as application platforms.
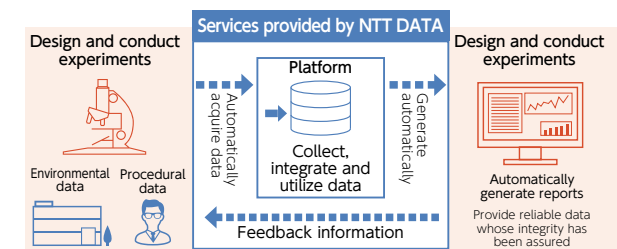
COTO LABO Consortium

Participants in the COTO LABO Consortium include NTT DATA and seven other companies: iPS Portal, Inc; Earth Environmental Service, Co., Ltd.; Olympus Corporation; Kataoka Corporation; Shimadzu Corporation; TASEI Corporation; and Hitachi Industrial Equipment Systems Co., Ltd. The Consortium focuses on launching next-generation laboratories to facilitate smooth technological transfer by developing a system for securing the repeatability of experiments and enhancing the reliability of data by the end of 2019.

Conducting a culture process

Roles played by NTT DATA

Conceptual diagram of the utilization of services offered by NTT DATA for life science fields

Description of service		Envisioned applications in life science fields
1 Consultation on information use	· Upstream consulting on the uses of information · Assistance via consultation for data development/management	· Chemical compound prediction assistance toward the promotion of efficiency of research for new drug development/medicine · Support for research data analysis toward the realization of more advanced research for new drug development/medicine
2 AI / Analytics	· Data analytics · Development of analytics design and analytical models, utilization and implementation of AI technology · General contract for all analytical processes	
3 Data management	· Preparation of data (e.g., data survey/preparation, data cleansing, annotation and other preprocessing)	· Construction of platforms for processing massive amounts of data including vital and research data · Development of research collaboration platform linking several research institutions
4 Platform for Utilization of Information	· Construction of analytical platforms (e.g., DWH, data lakes, data linkages)	
5 IoT- embedded development	· Construction and provision of IoT platforms (e.g., Designing architecture for mass data processing platforms, platforms for edge-side data processing) · Development of embedded software (e.g., automotive software, mobile software)	

Social

The NTT DATA Group addresses societal issues by harnessing IT and contributes to the development of a sustainable society by engaging its stakeholders.

NTT DATA Group's Approach

At the present time, as business becomes ever more global and IT continues to evolve, the needs that companies ask us to meet are becoming more diverse. Responding to those needs requires us to constantly hone our powers of foresight and create new mechanisms that are of benefit to society.

Recognizing the critical importance of providing its clients with safe and secure services, the NTT DATA Group has been actively facilitating the supply of, for example, highly reliable as well as people-friendly systems, thereby contributing to the development of society. Through these efforts we will create new businesses that will nimbly pick up on changes in the world and expand our business domains, while helping to resolve wide-ranging societal issues.

Contents

Number of overseas employees in FY2018
Approx. **86,154**

Women in management in FY2018
17.9%

Ocupational accidents in FY2018
5 cases

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With Clients

The NTT DATA Group provides safe and secure services to clients and strives to enhance these services by continuously keeping pace with client needs.

Management Approach

The NTT DATA Group strives to remain constantly abreast of emerging information technologies, applying new approaches to resolve the needs of our clients and society at large. We recognize the critical importance of providing clients with safe and secure services and provide highly reliable systems by constructing a systematic quality management system and establishing advanced methods for system development. To meet the diverse needs of our clients, we conduct client satisfaction surveys and carry out activities intended to reflect the opinions and requests we receive in improving our services so that they are even better from the client standpoint.

Innovation Management

The NTT DATA Group pursues innovation management centered on the core idea of harnessing IT to drive innovation, seeking solutions to societal issues and developing a sustainable society. We are sharing medium- to long-term issues with our clients to accelerate our efforts in diverse new businesses.

▶ NTT DATA's Digital

DIGITAL DRIVERS: Automate processes, Integrate ecosystems, Reinvent experiences, Provide new offerings, Create new business models

INDUSTRY SOLUTIONS: We're innovating business solutions that support our client's digital agenda and leverage our digital focus areas

DIGITAL FOCUS AREAS: Data & Intelligence, Intelligent Automation, Customer Experience, Internet of Things (IoT), IT Optimization, Cybersecurity

Basic Policy

Rapid advances in technology are prompting drastic changes in business and living environments, creating new markets and prompting innovation in existing businesses. To ensure optimal decisionmaking in response to these conditions, we believe in the importance of working with clients to clarify changes in the business environment and then looking to the future, elucidating the path ahead of us.

NTT DATA publishes the NTT DATA Technology Foresight, which gives our insights in innovative technologies that the Company expects will affect future business and living environments. In this way, we aim to help address our clients' business issues and various societal issues, as well as to contribute to further advances in our clients' businesses. We have also identified "Digital Focus Areas" as our focus technology domains that will be subject to priority investment measures.

"Digital Focus Areas"

In July 2017, NTT DATA established the Global Marketing Headquarters to handle cross-Company initiatives aimed at bolstering its brand in global markets. The headquarters is helping to create flexible, cross-regional alliances at the global level to support global client companies and promote the globalization of delivery resources.

We are also working with clients on digital strategies that will arm them to take the next step: accelerating digital transformation. We view our role as clearly defining and reinforcing the digital focus areas that will be necessary to this process.

Through such initiatives, we will partner with global clients to help them move their digital strategies forward. We will also work with clients on joint projects and investments in solutions, rebuilding our structure for approaching global client companies.

▶ "Digital Focus Areas"

Digital Focus Areas — Six Technology Domains Supporting Digitization

| Data & Intelligence	Intelligent Automation	Customer Experience	Internet of Things (IoT)	IT Optimization	Cybersecurity
The techniques and technologies used to create measurable business value from data, information, and knowledge.	The execution of automated business processes using AI, machine learning, and data science to make "intelligent" decisions & drive better outcomes.	The customer's perception and assessment of their interaction and experience with a company.	The connection of and communication between everyday physical devices via the Internet.	The ability of information systems and data to: rapidly respond to marketplace dynamics; meet the strategic needs of the business; and balance costs and risks.	The methods and capabilities used to prevent, defend, and protect information systems and data from damage, unauthorized use, modification, or exploitation.

NTT DATA Technology Foresight

NTT DATA conducts surveys and research on information industry trends (near-future outlook) that are expected to have a major impact on client businesses over the medium to long term, conducting its work from the client's perspective and based on societal and business issues. We also research the underlying technology trends. We release this information in the annual NTT DATA Technology Foresight report.

Specifically, we analyze political, economic, social, and technological trends. We also engage in wide-ranging information-collection activities and discussions that extend to NTT DATA Group companies and NTT R&D laboratories in Japan and overseas. These activities include interviews with external specialists in various fields. Through these activities, we have identified core issues warranting particular attention in social and business fields as well as groundbreaking technologies that are evolving and spreading with remarkable speed. Extrapolating from these, we have defined four information society trends and eight technology trends, on which we transmit information.

Through NTT DATA Technology Foresight, we work with clients to create an image of the future. By developing the technologies and services necessary to realize that future, we aim to create new businesses and promote the development of society as a whole. We take part in joint verification tests with clients around the world to confirm the feasibility and effectiveness of the technologies and services we have developed.

🖥 https://www.nttdata.com/global/en/foresight

▶ NTT DATA Technology Foresight Formulation Process
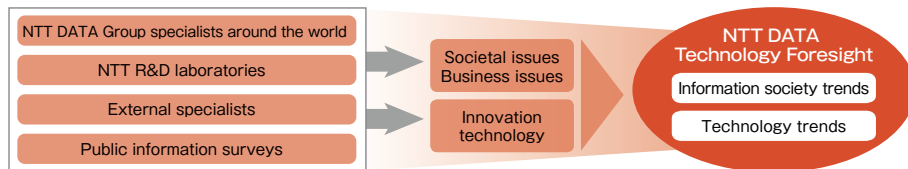
Establishment of the AI Guidelines

NTT DATA Group's AI Guidelines, which summarize the Group's approach, were established to mitigate discrimination and accidents caused by AI and utilize AI for social development. Based on the Guidelines, the NTT DATA Group will promote the development of AI technology and the application of the technology to business.

Outline of the Group's AI Guidelines
1. Realizing Well-being and Sustainability of Society
2. Co-Creating New Values by AI

3. Fair, Reliable, and Explainable AI
4. Data Protection
5. Contribution to Dissemination of Sound AI

🖥 https://www.nttdata.com/global/en/media/press-release/2019/may/ntt-data-introduces-ai-guidelines

Global Open Innovation

The growing prevalence and falling price of the Internet and various other technologies has increased the number of cutting-edge start-ups across the world. NTT DATA promotes open innovation, working with start-ups that possess advanced business models and technologies, as well as large client companies, to accelerate the creation of innovative businesses and create a win-win-win relationship between these organizations and NTT DATA. We have created a community of more than 4,000 people that takes part in regular monthly meetings as well as global open innovation contests. Through these contests, NTT DATA's business divisions engage in innovative business creation of a next-generation social infrastructure in collaboration with start-ups, and large client companies. Since the start of this activity in 2013, we have collaborated with venture companies in FinTech, energy, digital marketing, healthcare, and various other fields, resulting in the commercialization of more than 20 businesses.

Since fiscal 2016, we have held global contests. The contests help foster cross-border alliances among start-ups working to resolve a host of issues in various countries, clients hailing from different countries, and the NTT DATA Group's business divisions in those countries. The contests contribute toward truly open innovation, which leads to business creation and helps bolster the overall capabilities of the NTT DATA Group around the world. In fiscal 2018, we are launching the SDG Startup Program, aimed at leveraging open innovation to address the 17 SDGs outlined by the United Nations.

🖥 http://oi.nttdata.com/en/

▶ Concept Map
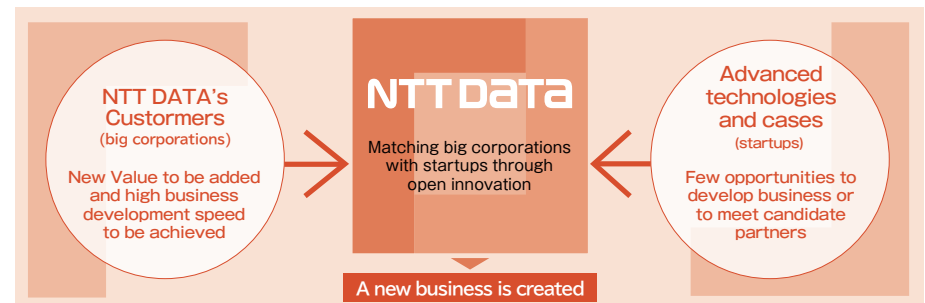
Activity in 2018

▌NTT DATA Open Innovation Contest

In fiscal 2018, we held the eighth and the ninth Open Innovation Business Contests. The winner of the eighth contest was Global Mobility Service Inc., which proposed a FinTech service that utilizes IoT technology to create a novel society where everyone takes advantage of mobility. The winner of the ninth contest, which took place in 20 cities around the world, was FlytBase selected in Mumbai, India. FlytBase proposed a large-scale platform that can be connected with all types of drones and operated via cloud computing. In each contest in the 20 cities around the world, the SDGs Award was given to start-ups working to address societal issues in various domains, such as health, community building, and energy. NTT DATA thus bolsters collaborative relationships with such start-ups. With the winning companies, NTT DATA set up dedicated collaboration teams and is conducting proof-of-concept (POC) activities in the lead-up to commercialization.

🖥 http://oi.nttdata.com/en/contest/9th/about/
http://oi.nttdata.com/en/contest/8th/about/

▌Grow Together × Open Innovation Business Contest

NTT DATA co-organized the Grow Together × Open Innovation Business Contest with Mitsui Sumitomo Insurance Co., Ltd. in the MS & AD Insurance Group, aiming to create new services in the non-life insurance industry. The finals took place in January 2019.

In the finals, projects were evaluated from such perspectives as business plan, synergy, growth, passion, and social impact (contribution to the SDGs). Otonomo Technologies, Inc. from Israel proposed a platform to provide automotive data and won the Grand Prize, while Halex Corporation and iRidge, Inc. won the Mitsui Sumitomo Insurance Prize. Together with Mitsui Sumitomo Insurance, NTT DATA will foster innovation through partnership with start-ups in the world that possess cutting-edge technologies and ideas.

🖥 https://www.nttdata.com/jp/ja/news/release/2019/013100/ (Japanese Version Only)

▌InsTech Open Innovation Business Contest

In collaboration with The Dai-ichi Life Insurance Company, Limited and Japan Post Insurance Co., Ltd., NTT DATA held InsTech Open Innovation Business Contest under the title of "Leading a New Era for the Expansion of Insurance × Healthcare 2019." The purpose of the Contest was to create new insurance products and services that lead to the improvement of QOL (Quality of Life) and the extension of healthy life expectancy of citizens. The finals took place in May 2019, and Sportip, which proposed physical conditioning by using AI posture analysis, won the Grand Prize. In addition, whomor, Tokyu Sports Oasis, and Frontier Market received the Dai-ichi Life Insurance

Prize, the Japan Post Insurance Prize, and the Technical Judges Prize respectively. Coaido and O: received the Audience Prize. NTT DATA will discuss specific ways for collaboration to realize the ideas in the proposals with the winners.

🖥 https://www.nttdata.com/jp/ja/news/release/2019/052000/ (Japanese Version Only)

Sharing the Fruits of Innovation

In a variety of ways, the NTT DATA Group shares its cutting-edge initiatives and contributes to the realization of a sustainable society.

▌Activities at the INFORIUM Toyosu Innovation Center

In 2015, we established the INFORIUM Toyosu Innovation Center. Since then, we have operated the center as a place where visitors can experience the cutting-edge technologies that the NTT DATA Group is developing.

As a place for creating new businesses with clients, the center offers space for holding workshops on co-creation activities. This space is used by domestic and international customers alike.

INFORIUM Toyosu Innovation Center

🖥 https://www.nttdata.com/jp/ja/foresight/inforium/en/

▌DATA INSIGHT

DATA INSIGHT communicates moves of people active at the forefront and trends of cutting-edge of technologies.

🖥 https://www.nttdata.com/jp/ja/data-insight/ (Japanese Version Only)

DATA INSIGHT

■ AQUAIR™ Digital Business Design Studio

AQUAIR is a place for co–creation for clients to work with UX-UI[1] designers and other specialists, where they can bring their ideas into reality seamlessly from planning of new Services, prototyping and feasibility test. For example, the UX-UI designer identifies users' needs and issues, the consultant assesses market trends and feasibility, and the engineer casts the ideas into shape. Various specialists thus form a team and offer consistent support to the clients' activities.

🖥 https://nddn.design/aquair#

[1]: UX (user experience) is users' experience and emotions obtained by using a particular product or a service. UI (user interface) is the point of contact for a user using a product or a service.

Initiatives for Improving Accessibility

The widespread adoption of IT in society has brought with it the problem of the digital divide[1]. The NTT DATA Group, recognizing in each IT user the potential for innovation, promotes the development of people-friendly information systems centered on universal design (UD)[2]. We are pursuing a wide-range of initiatives, from applying UD in the systems and services we deliver to clients to training and enhancing the awareness of employees.

Furthermore, the definition of "easy-to-use" services has advanced with an increasing importance on "user experience (UX)" approaching deeper "satisfaction" from the "user's point of view." UX indicates a way of thinking focused on the degree to which user demands for fun, comfort, and convenience can be realized. UX places importance on a user-focused design approach unlike traditional approaches rooted in technology or markets. Since 2002, NTT DATA has adopted designs from the use's perspective in its system development process in an effort to design systems that are people-friendly, satisfying, and resolve accessibility issues in the ICT and IoT fields.

▶ Improving Accessibility

UI	UD	UX
User Interface	Universal Design	User Experience
System appearance	Accessibility/usability	Experience gained through service
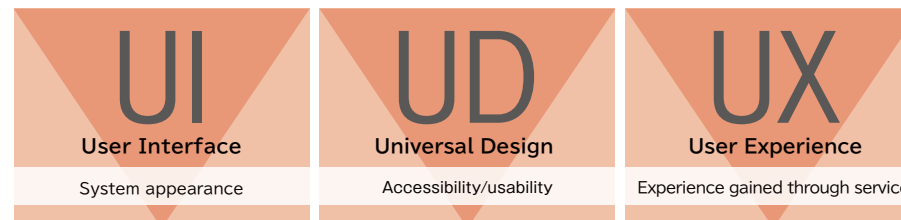
[1]: The economic and social gap or imbalance that exists between those who have access to computers and the Internet and the capability to use them and those that do not
[2]: Design aiming for ease of use by all people, irrespective of age, gender, nationality, disability, or individual experience and abilities

Trial Launch of the "Customer Friction Factor," a Metric for Quantitatively Assessing the User Experience

In April 2018, NTT DATA commenced the trial launch of the Customer Friction Factor (CFF), with a view to full-scale application in Japan. The CFF is a metric developed by NTT DATA Services to quantitatively assess user experience (UX).

End users make use of a wide range of communication channels, including stores, response desks, websites, smartphone apps, and telephones. When consumers accept services, flow lines grow more diverse, which can interrupt the smooth flow of services when the next step is unclear or in the event of a request for repetition. Systems and services that utilize corporate operations may also experience difficulties, when coordination is patchy or slow.

In addition to addressing such issues from the service provider end, consumers are increasingly calling for service improvements that focus on UX. Using conventional methods, assessing UX using quantitative diagnostics of multiple channels was problematic, and the scope for defining problems and executing improvement measures was limited. CFF is a quantitative assessment method in which specialists diagnose and quantify discomfort parameters that end users experience when using a service. Furthermore, relative values can be obtained through comparison with other services, making it possible to consider approaches for improving UX and confirm the level of improvement.

By applying CFF to a variety of projects, NTT DATA has verified assessment criteria for Japan by obtaining values from diagnostic and various other perspectives. We aim for a full-scale business rollout in fiscal 2020.

Developing Safe and Secure Systems

The bringing to fruition of systems and services that offer round-the-clock, year-round stability is a key responsibility and forms the basis for providing services to clients.

In realizing a social infrastructure that people feel safe and secure to use, the entire NTT DATA Group is engaged in, for example, the gaining of certification under quality management standards and the standardization of development and management methods. The Group is working to provide services that are geared to raising system reliability.

Initiatives to Improve Quality

Building a Management System Based on ISO 9001 and Continuously Promoting Improvement Activities

NTT DATA obtained ISO 9001 certification—the international standard for quality management—on a Groupwide basis in 1998 and subsequently adopted a systematic approach for a quality management system that is operational across the entire organization.

Since fiscal 2007, to bolster the system on a Groupwide basis, NTT DATA has created unified Companywide rules governing system development and management methods and has clarified procedures for applying the rules. Further, in March 2010 we formulated an implementation method to boost quality and productivity, which we have also deployed Companywide, under our unified rules.

NTT DATA quickly focused on making process improvements and enhancing the transparency of system development, and incorporated Capability Maturity Model Integration (CMMI)[3] into the formulation of development and operational standards. We have recognized the importance of raising the standard of quality control at development sites, including those of Group companies. We are therefore taking steps to roll out CMMI throughout the Group and to share quality management-related information.

As part of our global effort to enhance quality, we have deployed a quality assurance system at Group companies overseas. With support from Japan, we have achieved CMMI maturity level 2 in Romania. We continue to support process improvement utilizing CMMI to offshore locations in China. Through regular opinion exchanges within Asia, we are working to raise quality at overseas Group companies.

*3: CMMI is an approach managed by the CMMI Institute that expresses the level of maturity of the organization undertaking system development on a five-point scale.

▶ NTT DATA Quality Management System
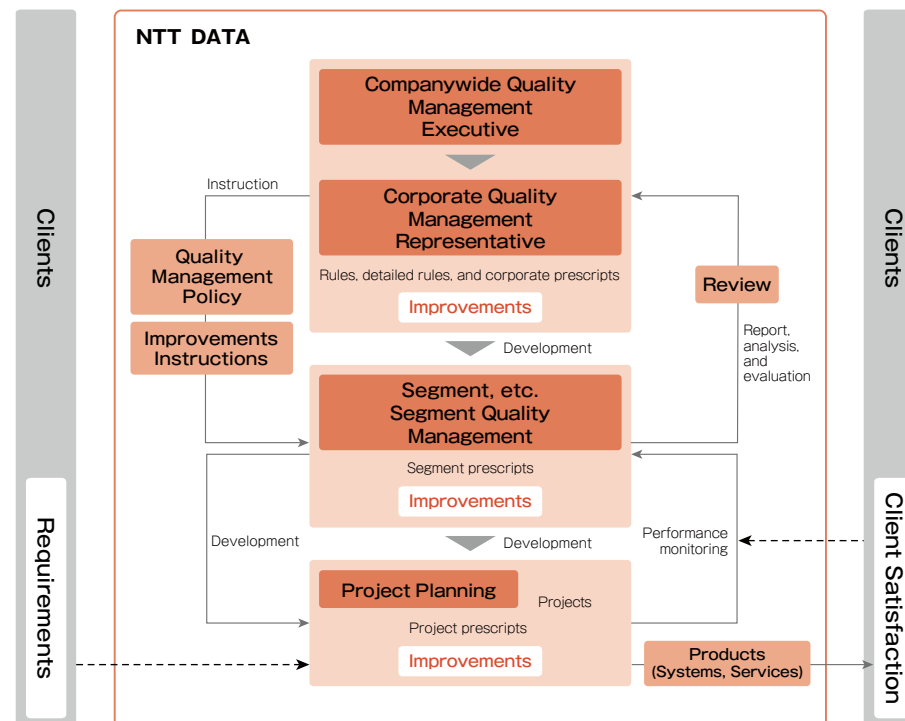
Enhancing and Standardizing Project Management

NTT DATA is endeavoring to enhance and standardize project management in order to improve the quality and efficiency of system development. We have established the Agile Professional Center as an entity that applies the agile development method to collaborate with clients in creating new businesses and services. We also integrated our R&D organization for production technologies, which also include project management, with our project support organization to establish the Project Management Solution Center.

▌ Agile Professional Center

The Agile Professional Center was established to create new businesses in collaboration with clients in response to the expanding business need for generating innovation. Around the world, we have established agile development locations, where we are reinforcing three functions: the cultivation of agile and professional human resources, advanced R&D, and an on-demand, agile development structure.

▌ Project Management Solution Center

The Project Management Solution Center was established to research and develop innovative project management methods, reinforce them through verifiable methods familiar to the actual worksites, and provide them within the Group in an easy-to-use manner. The center also established the NTT DATA Global Standards, which has unified standard operating procedures for system development throughout the world and is taking responsibility for the development of next-generation management tools that will raise efficiency of aspects of management such as tracking and quality assurance. The center provides complete, one-stop support for the adoption, introduction, and full utilization of solutions. Through expanded utilization of research and development results, the center is improving capabilities across the entire Group and is reducing the number of problematic projects.

▌ Quality Management Portal Site

Since fiscal 2010, NTT DATA has operated the Quality Management Portal Site. Our objective was to enable the sharing of all kinds of information related to quality among the different development locations, including those of Group companies.

This site offers responses to industry standards related to quality and consolidates internal rules and expertise, and we work to make this information available for use by all employees. Going forward, we will continue with our initiatives to reduce quality control operations by making better use of quality assurance expertise.

Response to Serious Issues

At NTT DATA, executives and employees promptly notify the quality assurance desk in the event of any serious quality issue with a commercial system. The Quality Assurance Department and external relations desk have set up an emergency contact system whereby the Corporate Management Committee deliberates countermeasures to highly serious issues. Particularly serious incidents are reported to senior managers. At the same time, we work to thoroughly ascertain and analyze the root cause of the loss, and preventive measures are formulated to prevent recurrence. We report to the competent authorities, as necessary, according to the law. We also notify customers by disclosing appropriate information on our website.

Measures to Ensure Security of Commercial Systems

Recently, there have been multiple incidents of illegal access to information through breaches (vulnerabilities) of information systems, resulting in personal and confidential information leaks, business disruption, and other harmful outcomes. Because most illegal accesses make use of known attacks, against which countermeasures are available, we should apply preventative measures across our systems without leaving any vulnerability.

The NTT DATA Group shares the latest trends in security technology and vulnerability information within the Group in a timely manner. In having built the system that is now in operation, the Group incorporated processes to maintain the necessary level of security and has established mechanisms to enable the system to maintain that level of security. The system in place is also subjected to regular security diagnostic testing carried out by security experts. To be able to provide safe and secure systems and services on an ongoing basis, the NTT DATA Group has worked on, for example, appropriate responses to newly discovered vulnerabilities.

Ensuring Safe and Secure Environments with Total Security Management

The NTT DATA Group harnesses the expertise it has gathered from its ample experience and track record to propose optimal solutions that reflect changes in the clients' business structure.

For example, we offer global security governance frameworks as well as offer superior security technology required for systems where safe operation is of paramount importance and the latest security methods for safe IoT environments.

It has recently become important to prepare against contingencies on the assumption that protective security measures may be bypassed altogether by sophisticated targeted attacks or information leaks caused by internal misconduct. To contain and localize the damage, we must provide reliable detection of an attack and swift response and recovery. We help to reinforce the security measures of our clients by offering security consulting to identify the risks and providing solutions and services for neutralizing and protecting against risks. Furthermore, we provide enhanced support services for detection, response, and recovery by constructing systems, including UEBA[1], EDR[2], sandboxes[3], SIEM[4], SOC[5], and CSIRT[6], as well as monitoring system management.

*1: User and Entity Behavior Analytics: Solution for learning behaviors of people and objects at normal times by machine learning and issuing alerts when abnormal behaviors are detected.
*2: Endpoint Detection and Response: Solution to keep an eye on the endpoints, such as PCs and servers, and enable integrated management of incident detection and subsequent response processes.
*3: Solution for detecting malware by running programs within a protected virtual environment.
*4: Security Information and Event Management: Solution for detecting, analyzing, and visualizing traces or signs of unauthorized access that are difficult to find by security equipment alone.
*5: Security Operation Center IDS/IPS: A center or an organization for comprehensive monitoring and management of firewalls, DB firewalls, WAFs, etc.
*6: Computer Security Incident Response Team: An incident response team of computer security specialists. The team collects and analyzes information on security incidents, security-related technologies, and vulnerabilities, and conducts activities including implementing effective countermeasures and training.

Initiatives for Improving Client Satisfaction

Initiatives that involve listening to what clients have to say and targeting improvements in their levels of satisfaction are an important issue when considering contributions toward addressing societal issues through business operations. In line with its Clients First approach, the NTT DATA Group strives to improve client satisfaction as a means of contributing to their success.

Promoting Improvement through Interviews and Questionnaires

In accordance with its belief that a client-oriented approach lies at the root of sustainable corporate growth, NTT DATA conducts oral and written surveys of its regular clients every year. The aim of this self-monitoring exercise is to enable us to deliver improved services from a client standpoint.

In fiscal 2018, we conducted interviews with and listened to the opinions and requests of people from 57 client companies and organizations, obtaining information regarding their opinions and requests. We also gained feedback through questionnaires received from 427 people in 183 client companies and organizations. The first questions in this survey are about the relationship with the Company, asking whether respondents intend to continue the relationship going forward and whether they would like to be the first choice for consultation. In response, 80% of clients responded "I would like to continue the relationship going forward" and "I would like to be the first choice for consultation." Based on interviews and survey results, the entire Company will engage in improvement activities, the analysis of results, identification of issues, formulation of improvement action plans, and the implementation of action plans.

In the years to come, we will continue to systematically engage in these efforts with the intention of further improving the level of customer satisfaction.

▶ NTT DATA's Actual Position for Customers

No intention of maintaining current relationship and selecting as primary candidate
2%

Intention of maintaining current relationship or selecting as primary candidate
18%

Customer responses
183
client companies and organizations
(427 people)

Intention of maintaining current relationship and selecting as primary candidate
80%

Message from the CEO | Company Data | Sustainability in the NTT DATA Group | Efforts to Make Social Contributions through Businesses | Social | Environment | Governance | GRI Standards

47

With Shareholders and Investors

NTT DATA is working to enhance its corporate value in response to the trust and expectations of its shareholders and investors by appropriately distributing profits and ensuring transparency in its information disclosure.

Management Approach

NTT DATA is guided by its fundamental policy of appropriately distributing profits while working to increase corporate value over the medium to long term by achieving sustained growth for the Group through such means as investing in new and other business activities and ensuring efficient management of business operations. We intend to pay a stable dividend based on a comprehensive assessment for achieving a balance between the sustainable development of our business and shareholder returns.

To increase the transparency of our management, we follow our Disclosure Policy and disclose information in a timely and appropriate manner. Additionally, the Disclosure Committee is responsible for formulating policies related to the disclosure of management information and for constructing a mechanism for reflecting all shareholder opinions in our management. The committee endeavors to enhance our IR activities and stimulate two-way communication by, for example, creating opportunities for direct dialogue.

Approach to Information Disclosure
Policy

NTT DATA adheres to its Disclosure Policy and discloses information of material importance to the Company in a timely, just, and fair manner in accordance with relevant laws and regulations, including Japan's Financial Instruments and Exchange Act and the securities listing rules of the Tokyo Stock Exchange.

Moreover, to the greatest extent possible, we actively endeavor to conduct fair disclosure of information that we consider to be useful to shareholders and investors, even when it is not deemed to be of material importance.

System for Ensuring Constructive Dialogue
System

NTT DATA has appointed a director to be responsible for IR and set up an office specializing in IR (the Investor Relations Office) to engage shareholders and investors in constructive dialogue. To ensure that internal departments collaborate on IR activities in a coordinated manner, we hold regular meetings of the Disclosure Committee, which has its secretariat in the Investor Relations Office and comprises representative directors, the head of the Finance Department, and heads of other critical organizations whose participation is requested by the Head of the Finance Department. The committee deliberates on the formulation of the disclosure guidelines for management information as well as its ongoing disclosure. The Disclosure Committee met eight times in fiscal 2018.

Mechanism for Reflecting Shareholder Opinions

We ensure that shareholder opinions and concerns gathered each quarter are effectively incorporated into the Board of Directors' meetings, regular meetings attended by representative directors, Disclosure Committee meetings, and other meetings.

Investors and shareholders' concern about unprofitable projects in the domestic business, profitability in the overseas business, and prospects for orders in the North American field as well as their expectation for explanation on how the new medium-term management plan can promote growth of sales and operating income in both domestic and overseas businesses and the synergies among the group company globally were feedback in 2018.

In addition to initiatives like these, we work to understand the opinions and concerns of shareholders and investors by providing them with opportunities for engaging in direct dialogue with the president and CEO and executive officers.

Returning Profit to Shareholders

Ensuring Stable Dividends Based on Operating Results and Financial Position

NTT DATA is guided by its fundamental policy of appropriately distributing profits while working to increase corporate value over the medium to long term by achieving sustained growth for the Group through such means as investing in new and other business activities and ensuring efficient management of business operations.

We will aim to pay dividends upon stable and comprehensive consideration of trends in consolidated results, financial conditions, business investment and technological development for future sustainable growth, and the balance between these dividends and expenditures aimed at the maintenance and enhancement of our financial constitution. Furthermore, when we determine dividend payment amounts, we place great importance on maintaining a consistent consolidated cash flow payout ratio[1].

[1]: Cash flow payout ratio: Total dividends / (Net income attributable to company shareholders + Depreciation + Loss on retirement of fixed assets – Capital expenditures)

▶ Annual Dividends per Share[2]

(Yen)

FY	Dividend
2014	12
2015	14
2016	15
2017	15
2018	17
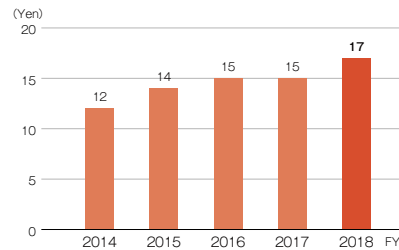
*2: A 1:5 stock split was implemented with an effective date of July 1, 2017. Figures from before fiscal 2016 are calculated as if the stock split had been conducted previously. Figures for fiscal 2016 are calculated as if the stock split had been conducted at the beginning of the fiscal year.

▶ Distribution of Ownership among Shareholders
（As of March 31, 2019）

Breakdown of Share Ownership

- Individuals and others 6.80%
- Governments and local public organizations 0.00%
- Financial institutions 20.95%
- Securities companies 2.25%
- Foreign institutions and others 15.45%
- Other corporations 54.55%
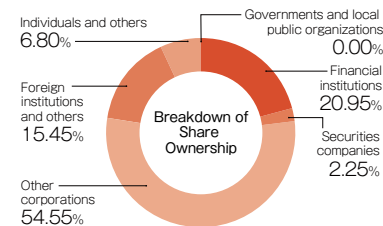
Communication with Shareholders and Investors

Enhancing IR activities for shareholders and investors and promoting two-way communication are key issues for NTT DATA's IR activities. To this end, we conduct briefings for institutional investors and individual investors in order to cultivate an understanding of our management strategies and business activities.

Direct Communication through Presentations and Meetings

NTT DATA holds quarterly earnings presentations, individual meetings, and small gatherings for all of its investors in Japan and overseas. At these events, top management explain results, the business environment, strategies, forecasts, and matters relating to ESG.

In fiscal 2018, we responded to about 270 inquiries from investors and analysts and held briefing sessions on the Company's payment business, which is of strong interest to investors. As part of our efforts to communicate with individual investors, we also held briefings for them both online and in groups. We will continue our efforts to promote two-way communication with shareholders and investors.

Reinforcing Information Dissemination through IR Tools

Since fiscal 2016, NTT DATA has been publishing annual reports as integrated reports for investors in Japan and overseas that are also available on its website. Moreover, since the 28th Ordinary General Meeting of Shareholders, we have disclosed the results and nature of our businesses activities on our website as well as the Tokyo Stock Exchange website before distributing it to shareholders by mail in an effort to facilitate access to such information.

Additionally, NTT DATA is working to reinforce its two-way IR activities. We accomplish this by offering the latest information in a timely manner through e-mails notifying press release updates and video streaming of results briefing, and taking questions and opinions from shareholders and investors.

We will continue to improve our IR tools to provide information on the results and nature of our businesses in a timely and easy-to-understand manner.

With Business Partners

The NTT DATA Group pursues initiatives for constructing a sustainable supply chain by promoting open and fair transactions toward a mutually successful future with its business partners.

Management Approach

The NTT DATA Group recognizes that building mutual understanding and relationships of trust with business partners is essential for conducting fair business activities. NTT DATA Group have created the "procurement policy" and the "fair trade rules" to ensure fair business practices. In addition to promoting open and fair transactions, NTT DATA Group strive to improve quality and create a working environment through active communication with our business partners, aiming for mutual development with them.

In order to build a sustainable supply chain, we have established and disseminated the "NTT DATA Guidelines for CSR in Supply Chain." We are also working with our suppliers to promote sustainability initiatives by conducting a questionnaire on CSR procurement, assessing compliance with the guidelines, and leading to future improvements.

As a new initiative, we provide feedback to suppliers who have responded to the CSR Procurement Questionnaire by plotting their performance and overall average. We believe that this will help our business partners clarify their focus points and strengthen their business in the future.

For important suppliers of software outsourcing, we hold Core BP Presidents' Meeting and BP Presidents' Meeting every year, in which the presidents of business partners (BP) participate, to deepen mutual understanding and improve the quality of software development. We also conduct mutual evaluations and interviews with them in order to prevent various contractual problems.

Building Strong Relationships with Business Partners

Properly managing a supply chain is a basic responsibility of companies that society demands. Along with promoting open and fair transactions, the NTT DATA Group works to improve the quality of its products and services and workplace environments through active communication with its business partners so that we can move forward together.

The proportion of new business partners (new suppliers that were screened based on the environmental criteria) in fiscal 2018 was 2% of all business partners.

Thoroughgoing Fair Transactions

Amid the widening acceptance of CSR, companies are expected to promote initiatives ensuring thorough compliance with fair business practices together with business partners. The NTT DATA Group strives to uphold fair business practices with its business partners by maintaining and publicizing the Procurement Policy and the NTT DATA Guidelines for CSR in Supply Chain.

Procurement Policy

NTT DATA publishes its Procurement Policy on its website as a basic guide to procurement transactions. We aim to engage thoroughly in fair transactions by setting up internal rules such as procedures for properly implementing procurement contracts. In May 1997, NTT DATA created its Fair Transaction Rules as a compilation of the laws, regulations, rules, and code of conduct that must be followed in transactions and contracts with customers and business partners. We have revised our Fair Transaction Rules periodically to reflect changes in laws and regulations.

Procurement Policy

1. We shall foster mutual understanding and build relationships of trust while providing opportunities for fair competition among our suppliers around the world.

2. We shall procure competitive products and services according to our business needs based on economic rationality and a comprehensive assessment of quality, price, delivery time, and reliability.

3. Our procurement activities shall respect human rights and consider the environment in order to contribute to society, while strictly adhering to laws, regulations, and social norms.

🖥 https://www.nttdata.com/global/en/about-us/company-profile/procurement-policy

Supply Chain Management

The NTT DATA Group fosters mutual understanding and builds relationships of trust with its business partners by appropriately monitoring and managing the supply chain. The Group also performs a spend analysis for transactions with all of its approximately 1,900 suppliers. From all transactions, we carefully screen our business partners in the key categories of software outsourcing, hardware, and software procurement to identify our key suppliers.

As of March 31, 2019, spending on transactions with key business partners accounted for approximately 34% of total transactions. Within this amount, for software outsourcing, we have established a business partner system for conducting evaluations based on transaction volume, quality, management conditions, and performance. Every two years, we accredit subcontracted suppliers displaying excellence as business partners (BPs) or associate partners (APs).

Additionally, NTT DATA objectively evaluates its partner companies in terms of quality, financial health, and contractual obligation, giving particular attention to their legitimacy, as part of its thorough efforts to promote fair transactions.

We have established the NTT DATA Guidelines for CSR in Supply Chain and are spreading their application among our business partners. At the same time, we also conduct surveys and evaluations regarding CSR procurement. By monitoring compliance with the Guidelines and measures taken by our business partners, we secure future improvements and promote CSR activities that involve close collaboration with our business partners.

Furthermore, we conduct a supplier survey the NTT DATA Guidelines for CSR in Supply Chain stipulating procurement that considers human rights and the environment as well as societal demands including quality and safety assurance of products and services. In fiscal 2018, approximately 30% of our business partners responded to this survey. We also interview managers and employees at the suppliers, as necessary, to confirm the status of their initiatives and identify problem areas as well as to disseminate our guidelines far and wide.

🖥 https://www.nttdata.com/global/en/about-us/company-profile/procurement-policy

Communication with Business Partners

Each year, NTT DATA conducts mutual evaluations and interviews to improve the quality of software development as well as prevent various contractual problems by deepening mutual understanding with key suppliers in software outsourcing. To forge sound relationships with its BP companies, NTT DATA holds annual Core BP and BP Presidents' Meetings, in which people in the top position at companies participate.

In October 2018, we held a Core BP Presidents' Meeting attended by representatives of all of our Core BP companies. At this meeting, we held discussions regarding the current state of NTT DATA, its management policies, trends in cutting-edge technologies, and the capabilities expected of digital professionals.

Representatives from 39 companies, including the five Core BP Companies, attended the BP Presidents' Meeting in December 2018, where they shared information and discussed topics including NTT DATA's management policies, trends regarding target growth in public & social infrastructure, financial and enterprise & solution segments, software outsourcing policies, results of mutual evaluations, and the need for rigorous efforts on compliance and information security.

Forging Win–Win Relationships

NTT DATA believes that forging solid collaborative relationships with its BP companies, including issues related to aspects of ESG, is effective for realizing a broad range of objectives, such as appropriate pricing, efficient operations, strict compliance, and information security.

The development of favorable relationships with BP companies has also contributed to securing human resources and improving productivity and quality at BP companies, which in turn has led to raising the competitiveness of the supply chain as a whole. Particularly when it comes to BP companies with similar business outlines, we are working to maintain highly competitive development capabilities by building good relationships with specific partners, improving the efficiency of various procedures, and sharing expertise.

With Employees

The NTT DATA Group is promoting the active participation of diverse human resources while seeking to strengthen its global competitiveness by creating a work environment in which employees feel comfortable in fully demonstrating their abilities and by nurturing an organizational culture that provides a genuine sense of personal growth.

Management Approach

The NTT DATA Group recognizes "diversity and inclusion" as one of its management strategies to succeed against global competition and achieve sustainable future growth by meeting the diversifying needs of society. In addition to enhancing various systems, such as a compensation system based on ability and a transparent personnel evaluation system, NTT DATA Grroup is promoting the creation of an organization that generates high value by promoting a work-life balance so that each and every employee can work actively and make the most of his or her individual abilities. We also conduct employee satisfaction surveys covering all employees at NTT DATA and its Group companies.

The results are analyzed and shared during training and in the workplace to discuss possible solutions for outstanding issues in an effort to create rewarding work environments and nurture an organizational culture that encourages the continuous growth of each individual employee.

Hiring and Promoting Human Resources

NTT DATA is committed to fair and equitable recruitment and employment that respect diversity, as we believe it is necessary to bring together diverse perspectives and diverse capabilities in a business environment where demand for new IT services and expansion into global markets is increasing.

We will continue to promote the hiring of new graduates, experienced employees, the employment of people with disabilities, and the re-employment of retired employees. By working together with employees with diverse values, NTT DATA aim to become a company that can create value that can only be created by us.

Hiring Human Resources

Hiring Diverse Human Resources

In our hiring practices we prioritize aptitude, motivation, and ability over gender, nationality, age, and academic record. Thus far, we have taken on new graduates from more than 100 educational

institutions and our diverse mid-career outreach channels include online sites.

While expanding its business fields overseas, NTT DATA has been proactive in its efforts to hire foreign nationals from several countries each year to work in a variety of fields, both within and outside Japan.

NTT DATA will continue to undertake broad-based hiring as it works toward becoming a Trusted Global Innovator.

▶ Data on Employees in Japan

		Fiscal 2015		Fiscal 2016		Fiscal 2017		Fiscal 2018		
		Non-consol idated	Group companies	Non-consol idated	Group companies	Non-consol idated	Group companies	Non-consol idated	Group companies	Group companies overseas
Number of employees		11,213	21,772	11,227	23,314	11,263	25,381	11,310	26,420	86,154
	Male	9,134	17,267	9,065	18,613	9,017	19,459	8,935	20,467	59,341
	Female	2,079	4,505	2,162	4,701	2,246	5,922	2,375	5,953	26,813
Number of employees in management positions		2,370	3,969	2,407	4,178	2,477	4,550	2,539	4,626	17,643
	Number of men in management positions (Ratio)	2,250 (94.9%)	3,770 (95.0%)	2,272 (94.4%)	3,937 (94.2%)	2,331 (94.1%)	4,272 (93.9%)	2,375 (93.5%)	4,324 (93.5%)	13,675 (77.5%)
	Number of women in management positions (Ratio)	120 (5.1%)	199 (5.0%)	135 (5.6%)	241 (5.8%)	146 (5.9%)	278 (6.1%)	164 (6.5%)	302 (6.5%)	3,968 (22.5%)

* Figures as of March 31 of each fiscal year

▶ Employee Data Concerning Average Age, etc. (Non-consolidated NTT DATA)

	Fiscal 2015	Fiscal 2016	Fiscal 2017	Fiscal 2018
Average age (In years)	37.6	38	38.4	38.7
Men	38.6	39.1	39.5	39.9
Women	33	33.4	33.8	34.1
Average years of service	13.9	14.3	14.7	14.9
Men	14.8	15.2	15.7	15.9
Women	9.9	10.4	10.7	10.9
Employee separations (Number of employees)	276	335	342	417
Number of male separations (Turnover rate)	241 (2.6%)	272 (3.0%)	286 (3.1%)	367 (4.0%)
Number of female separations (Turnover rate)	35 (1.7%)	63 (2.9%)	56 (2.5%)	50 (2.1%)
New managerial appointments (Number of employees)	180	183	188	195
Men	169	163	167	172
Women	11	20	21	23

* Figures as of March 31 of each fiscal year
* The number of resignee includes those who have reached retirement age.

▶ Number of Employees by Age (Non-consolidated NTT DATA)

	Total	Men	Women
Under 30	2,093	1,298	795
30–39	4,122	3,090	1,032
40–49	3,381	2,993	388
50–59	1,713	1,553	160
60 or above	1	1	0
Total number of employees	11,310	8,935	2,375

* Figures as of March 31, 2019

▶ Number of Employees in Management by Position (Non-consolidated NTT DATA)

	Total	Men	Women
Department manager equivalent or higher	571	546	25
Section manager equivalent	1,968	1,829	139

* Figures as of March 31, 2019

▶ Diversity Indicators

Indicators		Fiscal 2018
Percentage of female employees	Consolidated	28.4
Percentage of women in management	Consolidated	17.9
Percentage of women in junior management	Non-consolidated	13.1
Percentage of women in top management	Consolidated	9.4
Percentage of total female management working in the Profit Center Department (not including the Staff Department)	Non-consolidated	89.6

▶ New Hires and Reemployed Retired Workers (Non-consolidated)

		Fiscal 2015	Fiscal 2016	Fiscal 2017	Fiscal 2018	Fiscal 2019
Number of newly recruited graduates[1] (Non-consolidated)		379	378	385	418	430
	Men	255	247	245	266	276
	Women	124	131	140	152	154
Number of mid-career hires		8	15	26	96	–
	Men	7	12	20	77	–
	Women	1	3	6	19	–
Number of employees with disabilities[2] (Employment ratio)		260 (2.13%)	280 (2.27%)	287 (2.32%)	314 (2.51%)	315 (2.49%)
Number of reemployed retired workers[1] (Utilization ratio of the NTT DATA Reemployment System)		120 (72.22%)	105 (78.26%)	102 (77.42%)	95 (64.71%)	110 (80.3%)
	New recruitment	26	18	24	22	49
	Continued recruitment	94	87	78	73	61

[1]: Figures for the number of newly recruited graduates and retired employees using the NTT DATA Reemployment System are as of April 1 for each fiscal year.
[2]: The number of employees with disabilities is as of June 1 for each fiscal year. (Each person with a severe disability is counted as two people.)

▶ Starting Salary (Actual Results for April 2018) and Average Monthly Salary

	Doctoral Degree	Master's Degree	Bachelor's Degre	College of Technology Graduate
Starting salary	¥295,370	¥246,820	¥220,320	¥191,110

* Average annual salary for fiscal 2018: ¥8,280,000

Strengthen Hiring of Human Resources with Outstanding Expertise

Expectations for digital transformation, such as cost reductions through the use of advanced technologies, improved operational efficiency, and the creation of new businesses, are rising.

In light of this situation, in December 2018 we established the Advanced Professional System (ADP system), which employs "outstanding human resources" with outstanding expertise in advanced technology fields, as needed, in a timely manner with remuneration commensurate with market value, to enable customers to realize digital transformation more quickly and reliably.

Personnel Management System

NTT DATA's framework for managing employees emphasizes performance, achievements, and activities irrespective of employment status. We expect our employees to put the Group vision into practice and raise their level of professionalism. Our employees' concept of work focuses on performance and achievement through this approach, and it has firmly taken root across the Company.

Furthermore, we have developed a framework to reflect degrees of task achievement in the remuneration of contract employees, with options for conversion to permanent employment status for workers deemed to have high long-term performance potential.

We strive for transparency in our appraisals of performance by examining diverse aspects, including an evaluation of achievements against the employee's personal goals, through one-on-one interviews with managers and multidimensional evaluations.

In addition, we avoid placing disproportionate weight on short-term performance improvements by paying due consideration to mid- to long-term incentives for maintaining long-term motivation, such as an employee stock purchasing program, retirement benefits, and a defined contribution pension plan.

Nurturing Human Resources

Supporting Employee Skills Development

NTT DATA's personnel education and development is anchored in the employee's aspiration to learn and grow by setting goals on their own initiative. Our basic policy for personnel education is to offer on-the-job training (OJT) as the center of educational opportunities, complemented and enhanced by off-the-job Group training (OFF-JT).

At each workplace, we clearly define the roles of staff responsible for different aspects of training under a system in which employees set their own annual education plans as a means for raising motivation to learn by systematically addressing both the workplace and the employees.

Additionally, to meet the needs of the ever-changing business environment, we are focusing on nurturing human resources with advanced expertise and responsiveness to change, as well as those who can demonstrate their talents in the global marketplace.

▶ Approach to Personnel Education and Development
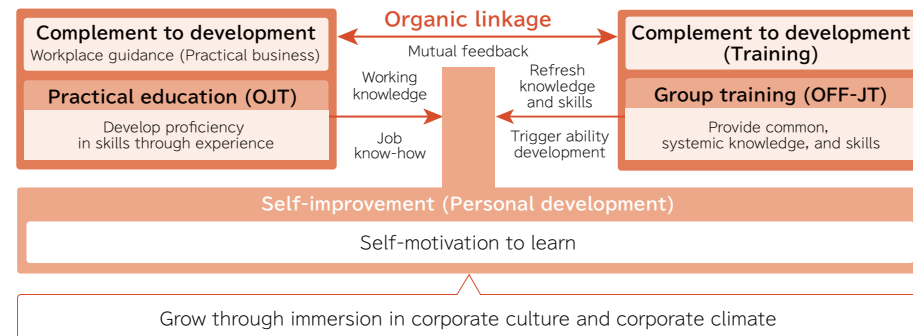
Framework for Various Training Programs

NTT DATA offers business training to facilitate business skills improvement, technical training to boost specialist expertise, and global training to hone global response capabilities, with employees free to select courses attuned to their position and job assignment when needed. Moreover, we have established an environment in which all our employees are able to acquire knowledge and skills to a certain degree pertaining to operations outside of their regular job assignments.

In new employee training, we offer programs for forming the essential mind-sets and abilities necessary for developing into disciplined human resources.

▶ Framework for Various Training Programs
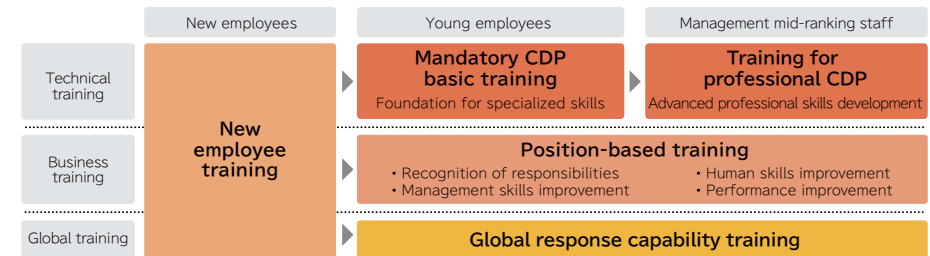
▶ Participants and Training Costs in Fiscal 2018

	Participants and Other Data	Annual Number of Study Hours per Participant	Training Cost per Participant
New employee training programs, etc. (Including mandatory CDP basic training)	Approx. 410	610 hours (81 days)	¥4.1 million
Professional CDP training	—		
Position-based training (Period covered, people undertaking training, by position)	—	60 hours (8 days)	¥500 thousand
Global response capability training	Approx. 1,350		
Professional CDP certification	Number of participants certified: Approx. 875 Aggregate number of employees certified: Approx. 9,800		

Human Resource Cultivation System Based on Professional CDP

As clients' IT needs diversify in this ever-changing business environment, companies require human resources who can respond appropriately and flexibly. NTT DATA has put in place a Professional Career Development Program (CDP) that was designed to transform its employees into professional human resources who are highly specialized and can flexibly adapt to change. Through this program, we show each employee's current accreditation level and what each employee needs to do to further develop his or her skills in an easy-to-understand format in order to support each employee's self-directed growth from the time they join the Company until retirement. We are seeking to apply the program to domestic Group companies as well.

The program has identified the types of human resources necessary for our business in a phased manner. Ten types have been identified so far. Business developers and data scientists will be added in fiscal 2019 to the types of human resources to respond to the changes in the technology and the business.

The creation of new solutions and the expansion of business fields are increasingly important today, so we will continue to work on promoting the cultivation of professional human resources in the NTT DATA Group.

Initiatives to Enhance the Capability to Adapt to Digitalization

To maximize the value it offers to clients and further promote digital transformation, NTT DATA takes measures to enhance the capability of all employees to adapt to accelerating digitalization. Since fiscal 2017, training and seminars about design thinking and ways to generate ideas have been implemented to equip employees with unconventional ways of thinking and perspectives.

Development of Human Resources Who Can Be Successful in the Global Market

In response to the rapid expansion of the overseas business, NTT DATA actively engages in the development of global human resources, who has the flexibility to be able to play an active role despite the changes in the market and the competitive environment. We mainly focus on Company-wide initiatives, which include the development of global leaders and the globalization of employees hired in Japan.

As joint programs with group companies across the world, the Global Workshop Leading Intercultural Team (GW-LIT), where participants learn how members from different countries think differently and how to overcome cultural differences to collaborate with them, and the Global Leadership Program (GLP), which is for the development of next-generation global leaders, are in place. In the GLP, participants discuss issues in the Company's global and local strategies. The program aims to urge them to consider, with a sense of ownership, what is necessary and what they should do to realize One NTT DATA both globally and locally. More than 600 employees have completed the two programs. We thus continuously engage in the development of global leaders.

Meanwhile, the Readiness Drive Program has been in place for young employees in Japan. Through exercises and group work, this program enhances the capacity to adapt to different cultures, facilitates understanding of the Company's global business, and improves English skills. The participants also make business proposals overseas and work in a multinational team as practical training. In addition, we offer not only training but various opportunities, such as the Business Acceleration Assignments (BAA) Program, which support employees to be assigned to overseas projects for enhancing global business experience.

Realization of human resource development platforms based on mutual respect on the diversity and individuality of employees from 53 countries in the world reflects NTT DATA's dynamism itself and is a driving force to elevate our business to a higher stage.
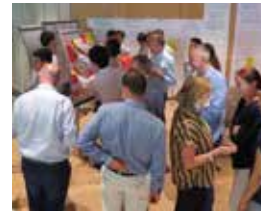
Global Leadership Program

Regional Leadership Program-JAC

Readiness Drive Program

▶ Framework for Global Human Resource Development

Directors — New employees

OFF-JT | OJT

■ Language
Support to acquire language skills
TOEIC test
TSST test
■ Business literacy
Grade-based training
Global lecture

New employee training
Readiness Drive Debut

Basic global business skill development

Readiness Drive I, etc.

Overseas training

Readiness Drive II
Silicon Valley training, etc.

Global Leadership Program, etc.

Multinational leadership training

* Conducted by grade accordingly

Study English abroad

Native communication coach

Overseas business experience

Business Acceleration Assignments, Overseas trainees, etc.

Promoting Diversity and Inclusion

Basic Policy

The NTT DATA Group has adopted the message "we enhance our creativity by respecting diversity" as one of the three pillars of its Group Vision, "Trusted Global Innovator." We are promoting diversity and inclusion based on these principles and recognize them as one of our important management strategies for success against global competition. By encouraging active participation from our diverse human resources and reforming their workstyles, we are working to create new corporate value.

| Message from the CEO | Company Data | Sustainability in the NTT DATA Group | Efforts to Make Social Contributions through Businesses | Social | Environment | Governance | GRI Standards |

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Promotion System

To encourage diversity and inclusion, we established the Diversity Promotion Office, under the direction of the Chief Personnel Affairs Officer, in 2008. Since fiscal 2012, we have concentrated on advancing women in the workplace and reducing annual work hours by changing workstyles in a bid to create a work environment where each individual employee can thrive.

We regularly hold sessions regarding female participation in the workplace at the NTT DATA Global Conference, which gathers Group leaders from countries throughout the world. In March 2019, we signed the WEPs and became a Global Supporter of Catalyst, which globally leads the promotion of women's careers and the development of business. We thus promote diversity and inclusion as the Group in and outside Japan.

Reforming Governance

To diversify the Board of Directors, NTT DATA has appointed foreign directors, outside directors and outside corporate auditors. In June 2019, one female director was approved. NTT DATA has also appointed female senior vice president to serve as secretary general of the Board of Directors to promote diversity in terms of internationality and gender. Diversity is also growing at the top management level and in other managerial decision-making stages, with the addition of female managers and foreign executives.

In addition to these initiatives, Board members participate in surveys regarding the Board's effectiveness and conduct self-assessments and analyses. Additionally, we have established an Advisory Board that gathers opinions and proposals from management and from experts outside of the Company.

Third-Party Evaluations

As a result of our various initiatives, we have received various third-party certifications and praise, including the Grade-3 (highest level) Eruboshi certification for promoting female participation in the workplace, the new Kurumin logo for supporting employee childcare, and inclusion in the Telework Pioneer 100 list for our activities related to telework. METI also awarded us its Diversity Management Selection 100 Prime Commendation in March 2018 for being one of the very top companies in Japan engaging in ongoing and companywide diversity management. As a listed company that actively engages in the empowerment of women, NTT DATA is selected as a Semi-Nadeshiko Brand Campany.

Active Participation from Diverse Human Resources

NTT DATA is actively engaged in creating environments in which diverse human resources can fully participate and display their abilities to the highest extent possible, regardless of their gender, nationality, age, disability, type of employment, culture, custom, lifestyle, value, sexual orientation, or gender identity.

Goals for Advancing Women's Careers

Following the enactment of the Act of the Promotion of Women's Participation and Advancement in the Workplace in Japan, NTT DATA formulated an action plan for developing the necessary environment for advancing women. It also gave us an opportunity to once again reflect upon past initiatives, and we intend to consistently and steadily work toward achieving our goals through a Companywide effort.

▶ Goals for Advancing Women's Careers (Non-consolidated)

Plan period	From April 1, 2016 to March 31, 2021
NTT DATA issues	1. While there were no outstanding issues regarding gender discrimination in hiring or the state of continuous employment between men and women, we must continue working to increase job applications by female students and develop the population of female science students applying for jobs. 2. Optimization of total working hours 3. Low percentage of women in deputy manager positions that make up the population of top management and other management positions, and candidates for management positions
Quantitative targets	**Target 1** Continue raising the percentage of female recruits to above 30% by the end of fiscal 2020 ▶ Maintained at above 30% for approximately the past 10 years **Target 2** Achieve average total working hours of 1,890 hours per employee annually by the end of fiscal 2018 ▶ Enhanced efforts since 2013 have resulted in a reduction to an average of 1,889.6 hours annually in fiscal 2018 **Target 3** Increase the number of women in management positions to at least 200 by the end of fiscal 2020 ▶ Increased by 18 women from the previous fiscal year to a total of 190 women, as of April 1, 2019 (Employees listed under Target 4 are not included among employed managers.) **Target 4** Increase the number of women in senior management positions (directors, heads of organizations, etc.) to at least 10 by the end of fiscal 2020 ▶ Nine women serve in senior management positions, as of April 1, 2019

Initiatives Aimed at Encouraging the Empowerment of Women

NTT DATA is placing particular focus on strengthening its diversity initiatives aimed at encouraging the empowerment of women. We conduct career development training to meet our target ratios for female employment and our objectives concerning the number of women working in management positions. Rounding out our varied diversity initiatives, we are also implementing diversity training for management.

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Primary Initiatives for Advancing Women in the Workplace

- Transmission of messages from top management through our in-house website

- Forums where top management discuss their own thoughts regarding diversity

- Diversity management training for current managers

- Formulation of development plans and monitoring for female employees

- Outside training for female candidates for leadership positions

- Seminars for promoting career development for employees on or about to take childcare leave

- Three-party career development consultations for employees who return from leave, such as childcare or nursing care leave

- Women's Initiative @ NTT DATA, voluntary activities by women in management positions

- Introduction of profiles and career descriptions of diverse women in management positions via the Women's Advancement website

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Women's Intiative

We are promoting D & I throughout NTT DATA Group through sessions on active roles of women in society and business in "NTT DATA Global Conference" where leaders from around the world gather.

NTT DATA Global Conference

LGBT and Sexual Minority Initiatives

NTT DATA is promoting initiatives that support sexual minorities, such as those in the LGBT community, from the standpoint of creating environments that allow for active participation from a diverse range of human resources. In addition to messages from top management, we are promoting initiatives, such as workplace seminars that promote understanding regarding LGBT issues, an LGBT helpline, annual LGBT seminars, and recruiting and behavior guidelines for "allies," straight supporters of LGBT rights. There are now more than 300 "allies." Starting in fiscal 2018, we have expanded systems concerning employees' spouses and families in traditional households to include same-sex partners. In addition, we participated in the LGBT parade on April 28, 2019.

Discussion in the LGBT seminar

Original LGBT t-shirt and flag

Promoting Employment of People with Disabilities

To help employees with disabilities realize their potential, NTT DATA has sought to create various work opportunities through NTT DATA DAICHI Corporation, a special subsidiary established in July 2008.

In addition to its initial operations, NTT DATA DAICHI began providing web accessibility assessment duties in fiscal 2012. In fiscal 2015, it began handling in-house delivery of reference materials as well as screening and approval of application forms. It started convenience store back office duties in fiscal 2016 and management of beverage vending machines installed in the Toyosu Center Building in fiscal 2018. Moreover, following the expansion of each of the Company's business operations, we continue to maintain hiring activities in collaboration with vocational training schools for persons with disabilities.

▶ NTT DATA DAICHI Activities

IT Services	Office Business	
• Maintenance and upgrades of internal and external websites for NTT DATA and Group companies • Basic skills training in website production for persons with disabilities • Web accessibility assessment duties	• Answering and redirecting calls made to main switchboards • Long-term storage and management of internal documents • Collection and shredding of confidential documents • Production of employee IC cards	• Office cleaning and greenery maintenance • Printing (Business cards, training texts, and other documents) • Delivery of in-house documents • Screening and approval of application forms • Convenience store back office duties • Management of beverage vending machines installed in the building

Promoting Reemployment of Retired Workers

The NTT DATA Group has introduced the "meister system" and the "career staff system" for employees who wish to be rehired after mandatory retirement, creating an environment in which they can continue working vigorously until the age of 65. The "meister system" is a full-time and monthly work system that is expected to achieve a certain level of results and performance by utilizing the work experience, ability to perform duties, and knowledge and skills acquired up to the mandatory retirement age, and by performing duties autonomously and independently as well as providing advice and support to younger employees. The "career staff system" offers routine work on hourly basis and work schedules and career staff can design their own work schedule.

Additionally, we have established a child and nursing care consulting service to help our employees feel secure in managing both work and child and nursing care. This service provides consultations regarding related systems and provides information and advice in response to the various doubts and distress that our employees may experience in their everyday lives. We hold nursing care seminars tailored to our employees' needs four times per year in order to provide support. We also incorporate balancing nursing care with work into our life plan training for 35- and 50-year-old employees. These initiatives are aimed at fostering an organizational climate that allows our employees to manage work with their private care needs. In addition to these initiatives, we have also joined the remote nursing care support services offered by the NPO, Umi wo Koeru Care no Te, providing direct nursing care support for our employee.

Life Plan Training

NTT DATA provides training and incentives for each age group to strike a work–life balance while offering total support for their life plans. We will continue to offer training and help for employees in designing their life plans in balance with work.

▶ Major Training and Activities in Fiscal 2018

Target	Content of Training	Activities in Fiscal 2018
All employees	● Cafeteria Plan System ● Asset formation via asset-building savings plans ● Turning points in life (marriage, childbirth, buying a home) ● Metabolic syndrome and self-care ● Public pension system and Company pension system ● Revisions in insurance and housing costs, savings and investment ● Public pension system and Company pension system ● Revisions in insurance and housing costs, savings and investment ● Nursing care and inheritance	Conducted online since fiscal 2018
Mandatory retirement age	● Retirement benefits, corporate pensions, public pensions ● Work options after retirement (internal system) ● Financial planning	121 employees participated in four sessions

Support for Continuing Careers

In order to help employees balance childbearing and rearing, nursing care, and work responsibilities with less worry, the NTT DATA Group is upgrading its leave systems while enhancing employee understanding and improving the workplace environment that makes these systems easier to use.

Other Primary Initiatives in Support of Career Continuation

• Offer an environment in which employees on childcare or nursing care leave can continue to view Company information

• Introduce childcare and nursing care leave systems and offer a communication handbook that provides support for those balancing care and work

• Hold seminars that support simultaneous management of work and nursing care

Upgrading Childcare and Nursing Care Systems

We are implementing various measures in terms of childcare support and, based on the Act on Advancement of Measures to Support Raising Next-Generation Children, received the Kurumin Next-Generation Certification Mark from the Ministry of Health, Labour and Welfare in 2008. Since then, we have continued to receive this certification, most recently in December 2017.

In terms of support for nursing care, NTT DATA has since 2011 enabled employees to use the

remote nursing care support services provided by the NPO Umi wo Koeru Care no Te with the aim of offering direct support to employees with nursing responsibilities at home. We also introduce the initiative in seminars on nursing care held four times a year to provide employees with a wide range of information and enhance their awareness.

In-House Day-Care Center, the Egg Garden

Stemming from an idea raised by employee volunteers, we established the Egg Garden, an in-house day-care center for our employees on the first floor of the Toyosu Center Building Annex in Tokyo, in December 2011. We support the continuation of employees' careers by creating an environment in which employees can give birth and take a leave of absence with peace of mind and return to work as early as planned.

Ten children were registered for the monthly childcare service, and 93 children were registered for the temporary childcare program in fiscal 2018. We will continue promoting use of the facility.

▶ Principal Systems (Non-consolidated)

Principal Childcare Systems	Principal Nursing Care Systems
● Childcare leave Childcare leave can be extended until the child reaches four years of age. The deadline for application to return to work is one month prior to the expected return.	● Nursing care leave Nursing care leave can be extended up to a maximum of 18 months.
● Shorter working hours for childcare Shorter working hours for childcare are available until the child completes his or her third year of elementary school. The application deadline for shorter working hours is two weeks prior to the start.	● Shorter working hours for nursing care Shorter working hours for nursing care are available for a maximum of three years separate from nursing care leave.

▶ Trends in the Number of Employees Using Childcare and Nursing Care Systems (Non-consolidated)

	Fiscal 2015		Fiscal 2016		Fiscal 2017		Fiscal 2018	
	Women	Men	Women	Men	Women	Men	Women	Men
Childcare leave (People)	149	12	160	20	172	19	173	45
Shorter working hours for childcare (People)	240	2	278	7	310	5	308	11
Nursing care leave (People)	3	3	4	4	5	6	6	2
Shorter working hours for nursing care (People)	1	0	0	1	0	19	0	2

▶ Percentage of Employees Who Return to the Company and Remain with the Company after Childcare or Nursing Care Leave (Non-consolidated)

	Fiscal 2015		Fiscal 2016		Fiscal 2017		Fiscal 2018	
	Percentage of employees who return	Percentage of employees who remain	Percentage of employees who return	Percentage of employees who remain	Percentage of employees who return	Percentage of employees who remain	Percentage of employees who return	Percentage of employees who remain
Childcare leave	98.4%	96.8%	98.2%	98.8%	97.3%	97.8%	100.0%	—
Nursing care leave	60.0%	66.7%	100.0%	100.0%	88.9%	87.5%	100.0%	—

Reforming Workstyles

In 2005, NTT DATA was engaging in workstyle innovation, aiming to become a company that provided its customers with change through IT in accordance with its Group Vision at the time, "Global IT Innovator." Starting in fiscal 2018, we have changed our Group Vision to "Trusted Global Innovator" and are continuously working to provide this innovation, currently through changes in our workstyles and how they affect our customers.

Our workstyle reforms involve more than just simply reducing working hours; while raising their own work quality, all employees are making time within their days to aim for self-actualization. By using this time effectively, they are achieving growth and making continuous and active contributions, helping us to achieve our goal of maintaining a strong level of competitiveness.

At the same time, NTT DATA is implementing health management practices, and aims to become a "Companies 'to be elected' in the Labor Market" by improving systems and working environments, improving development productivity, and correcting long working hours through cooperation with customers and business partners.

We will continue to grow by having our employees and the company influence each other positively.

Enhancing Digital and Global Skills of All Employees to Innovate the Workstyle

Starting from fiscal 2019, we have introduced the self-innovation time initiative, in which employees spend a part of their work hours on the innovation domain, such as enhancement of digital and global skills, innovation of workstyles by taking advantage of digital tools, and sharing of knowledge across the Company and with other organizations. As the common KPI for all organizations within the Company, we aim to take 40 hours of self-innovation time per employee in fiscal 2019.

Reducing Long Working Hours

▌ Promoting Initiatives toward Addressing the IT Industry's Issue of Long Working Hours

In the IT industry, long working hours are an ongoing problem. NTT DATA is promoting efforts aimed at decreasing total working hours based on the appropriate management of working hours.

Up to now, we have sought to manage working hours by recording computer log on and log off times and managing working hours using smartphones to log start and stop times. We have also set reduction targets for total working hours at each workplace and promoted the

▶ Total Annual Working Hours Per Employee (Non-consolidated)

(hour)

FY	Hours
2015	1,941
2016	1,910
2017	1,901
2018	1,890
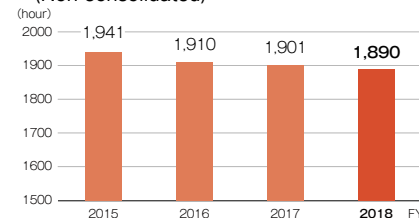
consideration and implementation of measures for attaining the targets. We report the progress toward the achievement of the reduction targets for each organization to the top management every quarter. Additionally, we have implemented a plan-do-check-act (PDCA) cycle, through which we continuously review and improve initiatives. In this way, we achieved the target for fiscal 2018 to reduce our average annual working hours to 1,890 per employee.

By using the BI platform Tableau, we also visualize the analysis results of data related to working hours in a secure and timely manner and share them within the Company. We use AI to detect the indication of long working hours and drive forward initiatives to prevent overwork.

▌ Encouraging Employees to Take Paid Leave

NTT DATA promotes work–life balance for its employees by encouraging them to be proactive in taking paid refreshment leave[1] and anniversary leave[2].

As a result of our promotional efforts, employees took an average of 17.6 days of paid leave per person in fiscal 2018. Moving forward, we will continue to incorporate various policies and measures while working to increase employee utilization of paid leave.

[1]: Employees can take more than four consecutive days of vacation when a work milestone is achieved.
[2]: Employees decide their own anniversary date and plan to take vacations every year on this anniversary.

▶ Average Paid Leave Taken in Days, Rate of Paid Leave Taken (Non-consolidated)

	Fiscal 2015	Fiscal 2016	Fiscal 2017	Fiscal 2018
Average paid leave taken in days per person	17.0	18.2	17.7	17.6
Average rate of paid leave taken (%)	85.0	91.0	89.0	88.1

▌ Opening the Way for Workstyles That Are Not Location Dependent

NTT DATA has operated a teleworking employment program since February 2008 as one specific strategy aimed at workstyle reform.

In April 2018, we revised our teleworking system to increase policy flexibility regarding where and for how long our employees can utilize teleworking. These revisions included removing limits on the number of teleworking days and allowing employees to telework in places other than their homes. Currently, about 90% of NTT DATA employees are taking advantage of this system.

Additionally, we have encouraged workstyle reform by establishing flexible time policies; more than half of our employees utilize our flex-time system, which began in April 1993, and our discretionary work system, which began in December 2010.

Furthermore, we are establishing new infrastructure by moving our development environment to the cloud and implementing teleconferencing. Moving forward, we will continue to promote workstyle reforms that enable our diverse human resources to contribute actively.

▶ Teleworking System Users and Their Proportion (Non-consolidated NTT DATA)

	Fiscal 2015	Fiscal 2016	Fiscal 2017	Fiscal 2018
Teleworking (Includes mobile work) number of users	7,408	7,673	8,807	10,215
Teleworking (Includes mobile work) ratio of users (%)	66.1	68.3	78.2	90.3

Participation in Telework Days as a Special Cooperating Organization

The Tokyo metropolitan government and relevant government ministries designated July 24 as "Telework Day" in 2017 and have launched a national campaign for workstyle reform. In 2019, a period of approximately a month, from July 22 to September 6, was designated as Telework Days 2019, as a rehearsal for the Tokyo 2020 Olympic Games. As in 2018, NTT DATA participated in the initiative as a "special cooperating organization," an organization cooperating in measuring the impact of large-scale teleworking by 100 or more people. As the area where we have multiple business sites, including the Toyosu Head Office, is expected to experience congestion in 2020, we also participate in the 2020 TDM Promotion Project, which manages the transportation demand concerning the Tokyo 2020 Games, and the "Smooth Biz" initiative promoted by the Tokyo metropolitan government.

The ten days from July 22 to August 2 were designated as the period for teleworking. We asked for cooperation of not only all NTT DATA employees bus also Group companies and contractors. After the period, we reviewed the impact and identified issues to prepare for 2020. A total of 86,100 NTT DATA employees participated in the initiative by the following means.

· Teleworking: Approximately 39,200 people
· Shifting commuting times by taking advantage of discretionary work and flex-time systems: Approximately 31,200 people
· Taking time off for annual paid leave and summer vacations: Approximately 15,700 people

NTT DATA continues to promote measures related to workstyle innovation. As a company that broadly deploys IT services that support corporate workstyle reforms, we are also contributing to workstyle innovation in Japan.

Primary Initiatives Promoting Workstyle Reform

- Ongoing implementation of the "changing workstyles" seminars for newly appointed department and section managers

- Environmental improvements tailored to each organization that allow for flexible workstyles, including Companywide conversion to thin-client terminals, discretionary work systems, teleworking systems, and flex-time systems

- Efforts to encourage employees to take paid leave (including refreshment leave and anniversary leave)

- Flexible operation of system ensuring break time

- Increase in the number of employees that can utilize our teleworking system and the number of places in which they can engage in telework

- Introduction of successful workstyle reform examples through our in-house website

Employee Health Maintenance and Promotion

Organizational Structure for Employee Health Maintenance and Promotion

NTT DATA promotes employee health and mental healthcare in cooperation with its various workplaces centered on the industrial physicians and health nurses at its Health Promotion Office.

Initiatives for Health Promotion

Stress Checks for All Employees

NTT DATA implements an annual stress check for all employees and conducts group analysis in each workplace. The results are provided as feedback to each workplace to improve the environment.

▶ Flow of the Workplace Improvement Program

Step 1	Step 2				
Conduct stress checks	Implementation of the Workplace Improvement Program				
Check workplace conditions	Feedback on the workplace checks to each workplace	Facilitator briefings	Conduct workplace discussions	Implement improvement measures at each workplace	Evaluate (Follow-up confirmation of workplace conditions)	Obtain feedback from evaluation results
Employees respond to web-based stress survey	Provide feedback about one week after the check	Explain methods of holding workplace discussions in detail	Share survey findings with workplace colleagues, examine improvement measures		After implementation, conduct follow-up survey to confirm improvements before vs. after

Increasing the Rate of Medical Checkups

As part of its employee benefit program, NTT DATA provides comprehensive medical checkups using its cafeteria plan. In fiscal 2018, 6,010 employees (53% of all employees) underwent comprehensive medical checkups that included additional items beyond those covered by statutory medical checkups.

In addition, after the health examination, we conduct an online health interview for all employees to check their subjective physical and mental symptoms as well as their working conditions. This helps to detect people with physical or mental health problems at an early stage and to raise employee awareness of self-care.

The percentage of employee who have a complete medical checkup is 100%. To build a system for early detection of diseases among young people starting in fiscal 2019, we will provide comprehensive medical examinations in 5 year increments from the ages of 30 to 60, which are more thorough than the statutory medical examinations.

Interview Employees Working Long Hours

Since fiscal 2011, we have conducted a "fatigue accumulation check" for employees who work more than 45 hours overtime a month. If accumulated fatigue is confirmed, an industrial physician or public health nurse will interview the employee.

Implementation of Health Education

Implementation of Education for Self-Care and Reporting Line Care

NTT DATA conducts training to raise self-care awareness and raise awareness of care to the people around us during milestones.

In particular, we provide managers with training from the perspective of line care. In fiscal 2018, 198 managers attended such training.

Implementation of Health Education for Young Employees

NTT DATA aims to foster health awareness among employees younger than the ages subject to statutory specific health guidance. To this end, we provide health education for all employees in their first and second years of employment, who are building the foundation of their lifestyles, and all employees at the age of 35.

In addition, we offer specific education programs for high-risk employees in their 30s.

▶ **Health Education Implemented in FY2018 for Employees in Their 30s**

Age 30	✉ E-mail	Self-care is important especially when there are changes in the environment. When employees becomes 30s, we deliver e-mail newsletters to communicate the current state of health issues in the Company and the importance of protecting their health by themselves.
Age 35	Experience-based group training	Participants reflect on their health, which they are often too busy to do in their daily lives, and take part in exercising and relaxation workshops as they learn about metabolic syndrome.
Ages 31, 33, 37, 39	Experience-based group training	Abnormal blood test results? A program to improve lifestyle habits, including exercise, is offered to employees whose medical checkup results showed the risk of metabolic syndrome.

Groupwide Expansion of the White 500 Certification

The entire Group is working on health management. As a result, 6 Group companies, in addition to NTT DATA, have been certified as "White 500" under the Ministry of Economy, Trade and Industry and the Tokyo Stock Exchange's system of recognizing corporations that are implementing initiatives tailored to local health issues and practicing good health management.

健康経営優良法人
Health and productivity
ホワイト500
2019

[White 500 Certified NTT DATA Group Companies]
・NTT DATA (2 consecutive years)
・NTT DATA SYSTEM TECHNOLOGIES (2 consecutive years)
・NTT DATA CUSTOMER SERVICE (2 consecutive years)
・NTT DATA SMS
・NTT DATA BUSINESS SYSTEMS
・NTT DATA MSE
・NTT DATA CHINA OUTSOURCING

Industrial Accident Prevention Initiatives

With regard to the prevention of industrial accidents, in addition to conducting two annual workplace safety patrols, we engage in activities to raise in-house awareness of National Safety Week, National Industrial Health Week, and the Accident-Free Holiday Campaign organized by the Ministry of Health, Labour and Welfare and the Japan Industrial Safety and Health Association. Going forward, with the aim of achieving no accidents, the Health and Safety Committee will continue its efforts to ensure that employees remain on guard against potential hazards while endeavoring to completely eliminate occupational accidents.

▶ Number of Occupational Accidents

	Fiscal 2015	Fiscal 2016	Fiscal 2017	Fiscal 2018
Number of occupational accidents	7	4	6	5

* Data for FY2015-2017 revised following the scope of target redefined

Labor Relations
A Better Work Environment Based on Labor–Management Dialogue

The Company conducts labor–management talks with NTT DATA unions regarding issues pertaining to working conditions as they arise. NTT DATA's basic stance is to emphasize thorough dialogue between labor and management in addressing various issues. Additionally, essentially 100% of our employees are members of labor unions, excluding managers, who are not permitted to join unions, as they are responsible for administration of operations.

Pursuing Employee Satisfaction
Ongoing Employee Satisfaction Surveys

The NTT DATA Group strives to improve workplace environments and Company mechanisms and ascertain issues pertaining to the creation of a company where employees can work comfortably. These efforts include the regular implementation of attitude surveys targeting all NTT DATA Head Office and domestic Group company employees, which are connected to workplace environment improvements. In the fiscal 2018 survey, NTT DATA Head Office employee satisfaction was ranked 3.73 points out of a total of five points, indicating continued satisfaction. Additionally, 68% of employees reported high levels of engagement, on par with prior results.

We also began conducting the "One Voice" employee engagement survey for employees working at our Group companies overseas. The NTT DATA Group will continue striving to create rewarding workplace environments through these initiatives.

▶ Employee Satisfaction Survey Results (NTT DATA, domestic Group companies)

(Points) / Ratio of full-time employees (%)
- Employee satisfaction
- Ratio of respondents to all employees
- Ratio of employees with high levels of engagement

	2015	2016	2017	2018
Ratio of respondents	95	93	90	89
High engagement	64	66	66	68
Employee satisfaction	3.73	3.70	3.68	3.73
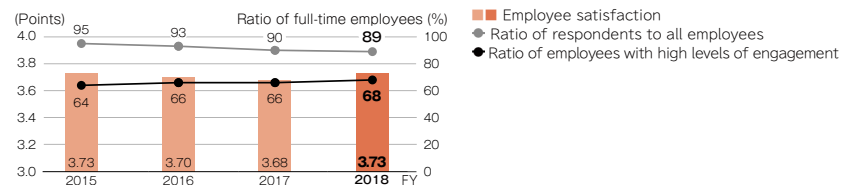
NTT DATA Kids Lab

To help raise employee satisfaction, the Technology and Innovation General Headquarters holds the NTT DATA Kids Lab at our Head Office in Toyosu. This event is conducted twice per year, during spring and summer break, for our employees' elementary- and middle school-aged children. A total of 29 children participated in the event in fiscal 2018, which had "global" and "programming" as its themes. Under the theme "global," the children made and presented a newspaper with foreign employees that introduces the employees' home countries. Under the theme "programming," they operated robots using their own programs. Survey indicated that 80% of children experienced changes in awareness regarding their parents'work thanks to this program, and nearly 90% of these parents expressed satisfaction with the event.

Global Workshop

Computer Programming Workshop

With Regional Communities and Society as a Whole

The NTT DATA Group works to create and develop a healthy society through social contribution activities that emphasize employee participation, and through the development of IT systems designed to help resolve societal issues.

Management Approach

The NTT DATA Group contributes to the advancement of society as a whole by providing services for global societal issues, such as social infrastructure and business-category-specific solutions that take advantage of IT and advanced technologies. We promote effective initiatives to encourage each individual employee to proactively pursue social contribution activities. We will continue to fulfill our responsibility as a corporate citizen by engaging in effective social contribution activities that are in line with international initiatives and guidelines such as the SDGs adopted at a United Nations summit in 2015.

Contributing to Regional Communities and Society as a Whole
Promoting Social Contribution Activities

NTT DATA conducts activities that benefit people, targeting fields that include education, welfare, regional communities, and international contribution as well as a diverse array of activities related to the natural environment, culture, and the arts. At the same time, we are working to raise employee awareness concerning volunteer activities, while promoting a wide range of activities, including those that take advantage of our business activities and initiatives that are implemented throughout the Group.

▶ Expenditures for Social Contribution Activities

(Millions of yen)

	Fiscal 2015	Fiscal 2016	Fiscal 2017	Fiscal 2018
Expenditures for social contribution activities	271.07	299.36	320.15	273.78
Donations (Funding for matching gifts: Amount extended by the Company)	93.10	138.40	37.27	200.28
Expenditures for various other social contribution projects	177.97	160.96	282.88	73.50

Record of Social Contribution Activities

The NTT DATA Group, as a global corporate group, is conducting a variety of activities to help establish better societies in regions throughout the world.

Consolidated coverage
53 countries and regions

Number of consolidated subsidiaries
307

Number of participants in contribution activities
17,181

Cost of contribution
¥524,040,000
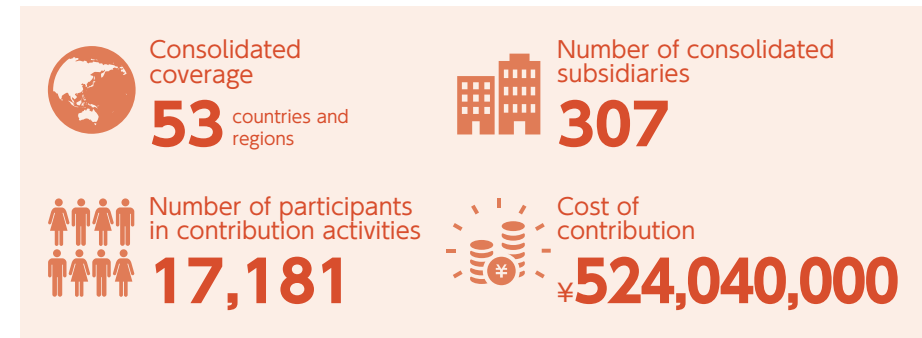
EMEA and Latin America

Cost of contribution activities
¥25,070,000

Number of participants in contribution activities
3,500

China, APAC, and Japan

Cost of contribution activities
¥278,790,000

Number of participants in contribution activities
7,681

North America

Cost of contribution activities
¥220,180,000

Number of participants in contribution activities
6,000

■ EMEA and Latin America
Narrowing Gender Gaps through IT   [everis]

everis launched the #girlsgonna educational initiative based on CLOQQ*[1] in November 2017, under which the company has been working with its employees and customers as well as with media organizations to close the gender gap through the use of IT. Recognizing the importance of breaking down gender stereotypes as a precondition to attract women to the tech industry, the company has implemented unique initiatives. For example, it created and released an animated story about Krook, a monster embodying gender stereotypes, with a view to communicating the importance of eliminating gender prejudice to viewers. Moreover, in order to increase children's interest in science, technology, engineering and mathematics (STEM), the company distributed copies of the "Woman in Science book," which introduces 50 women from around the world who have made notable contributions, to 70 media organizations as well as to around 2,182 customers in six countries.

Moreover, the company asked a total of 944 international organizations, including the European Commission, NATO and the Spain Chamber of Commerce to enter the website to donate a second copy to an educational center of their choice.

*1: Online learning support tool to help children freely exercise their power of imagination

Green Initiatives, Health & Traffic Safety Awareness-raising Initiatives, and Helping underprivileged and mentally challenged kids [itelligence India Software Solutions Pvt. Ltd.]

itelligence India Software Solutions Pvt. Ltd. launched "Umeed" in 2017. Since then, at least 200 employees have been conducting a range of activities, including Green Initiatives, Health & Traffic Safety Awareness-raising Initiatives, and Helping underprivileged and mentally challenged. In fiscal 2018 the company conducted a several green initiatives in the Hyderabad high-tech district. Participants in the activity planted 1,000 trees, thereby contributing to a 10% reduction in air pollution and to the improvement of the local landscape. Moreover, the company conducted traffic safety by educating drivers using placards on importance of helmets and seatbelt. Also, the company helped Radha Institute of mentally challenged and conducted sports day for them and planting saplings in the school along with the students.

Development of Support Tools for People with Communicative Disabilities [everis]

The everis Group provides IT services in Spain and South and Central America. It conducts social contribution activities in 11 countries where it operates. Under the leadership of the everis Foundation established in 2001, the everis Group has been fostering the development of human resources in the fields of education and science, the development of entrepreneurs, and the creation of a fair and equal society. More than 1,000 employees have participated in their company's social contribution activities and the company has also cooperated with more than 500 external volunteers. The everis Foundation implements a range of initiatives including the Social Intrapreneurship Awards*[2], of which IntegrarT was named a recipient. IntegrarT is a system to support people with communicative disabilities in learning and achieving social inclusion. People with communicative disabilities are not uncommon. Such disabilities can be caused by infectious diseases, lack of oxygen to the brain, brain tumors and others. IntegrarT, developed by everis employees, uses pictograms and voice messages to help people with communicative disabilities engage in dialogue with others, thereby supporting them in learning and taking part in social activities. It is said that IntegrarT has at least 20 million potential users, and the everis Group plans to improve and popularize the system for use by even more people.

*2: System for commending everis Group and NTT Data Group employees who are leaders of socially important technological and innovative projects. Under the system, support was given to a total of 120 teams in 14 countries over three years. Recipients are invited to NTT Data's head office for a week, where they receive advice on their projects.

Screen of the IntegrarT application

Members of the IntegrarT development team and Business Strategy Department, Americas & Europe Region

■ Japan, China, and APAC

Support to Japan Team in the International Olympiad in Informatics [NTT DATA]

The International Olympiad in Informatics (IOI) is an international intelligence competition in which high school students who can be fittingly called experts in mathematical information science get together and compete by harnessing their outstanding talents and skills and forge close friendships. NTT DATA Group has contributed to the event as an official sponsor of the Japanese Committee for the IOI by supporting teams entering the competition as representatives of Japan in many ways, including providing NTT DATA Komaba Employee Training Center to be used as a venue for the participants' training camp and award ceremony.

The 30th International Olympiad of Informatics was held in Japan from September 1 through 8, 2018. A total of some 860 people participated in the event, including 335 students from 87 countries and regions worldwide.

The Voice of Stakeholder

Expecting NTT DATA to Be a Platform Where Talented Human Resources Can Thrive

NTT DATA supports us in various ways, such as advertising the IOI. As the Olympiad was not widely known in Japan and it had been difficult to attract attention, the proposal to roll out advertisements on various media, including YouTube, helped us greatly.

Social demand for computer programming is extremely high. We aim to develop a large number of talented human resources even further through the Olympiad and training camps. We expect IT companies, such as NTT DATA, to take advantage of their abilities and offer them a platform where they can thrive.

Mr. Katsuhiko Kakehi
President
The Japanese Committee for the International Olympiad in Informatics

Helpful Opportunity to Develop IT Human Resources

I participated in the 7th and 8th Sessions of Japanese Olympiad in Informatics (JOI) as a high school student. Before that, I knew the basics of programming that I learned through club activities in school. After attending the JOI, however, my interests in programming grew further and I started learning it more seriously. Through participating in the JOI, I came to find pleasure in mathematics and algorithm, and when it was time for me to find a job, I made up my mind to pursue a career in these fields. That's how I landed a job in NTT DATA Mathematical Systems, Inc. At present, I work in the Company's Optimization Division in a position that requires me to apply my knowledge of mathematical optimization to help our clients resolve their issues by, for example, designing efficient delivery plans. I believe that the JOI, being a science competition open to all students in high school or younger, also serves as a great opportunity for developing IT human resources.

Shogo Kishimoto
NTT DATA
Mathematical Systems Inc.

IT Experience for Children, the Future Leaders of the Next Generation [NTT DATA]

Every year, the Public Relations Department organizes IT Experience for Children as an event offering elementary school children a fun opportunity for understanding IT. When launched in 2004, the focus was to offer hands-on experience with IT through various systems. Since 2014, the content has been changed into a programming class that children can enjoy, with emphasis on creating one's own system with IT. In fiscal 2018, the event was held at the NTT DATA Komaba Training Center on July 29. A total of 73 children participated. Programming is a way for us to actualize our ideas for the future. Accordingly, we will continuously work to provide fun IT learning opportunities that will inspire children to create their own futures.

Programming Workshop

The Ideathon for Predicting the Future [NTT DATA]

NTT DATA has been offering opportunities for mainly high school students to experience IT-related work experience in the form of workshops conducted by Graduate Recruitment Group of HR Headquarters.

As a part of such efforts, in February 2019, they conducted an event called "MIraiyosoku de Ideathon (The Ideathon for Predicting the Future)" on a pilot basis.

Over 30 high school students participated in the event, had group discussions, developed ideas to transform a convenience store's operationusing information technology and presented them. Although this was the first such initiative, 100% of the high school students who participated in the survey were satisfied with it, and 94% answered the workshop either deepened or very much deepened their understanding of an IT company and IT industry". In September 2019, the 2nd pilot was held, and ideas for solving daily dissatisfaction with IT were developed by the group and presented using the Business Model Canvas.

On the day of the event, there were some unique ideas, such as wearing a bodysuit that incorporates a schedule, and "digitizing the train delay certificates" won the championship by a majority vote. A students needs to submit a delay certificate to school if they arrive school late due to the delay of a train thus this idea is of significance to them.

IT-driven activities inspiring high school students

Social Technology Officer (STO) Creation Project [NTT DATA]

A Social Technology Officer (STO) is an occupation first created in Japan as the social sector version of a Chief Technology Officer. A STO plays a role in formulating strategies at the

management level for the utilization of IT by NPOs. NTT DATA is working with the Japan NPO Center and Code for Japan to foster both "IT professionals who want to become a STO" and "NPO managers who accept a STO in their organization" in order to create a society in which STO activities function effectively. Specifically, we hold workshops to build a common understanding with NPOs about the definition and role of a STO, and create learning materials for people who want to become a STO.

A meeting of the Experts Committee for developing materials in progress

Offering a Global IT Human Resources Development Program [NTT DATA Vietnam]

Since 2017, NTT DATA Vietnam has been providing students of Machida Technical High School, a high school in Tokyo that focuses on developing human resources to work in manufacturing and IT fields, with opportunities to conduct fieldwork in Vietnam.

In 2019, in the program's third year, 15 students and five teachers participated the program. During the fieldwork session, employees of NTT DATA Vietnam joined with the participants and worked in groups, going to train stations and markets to conduct interviews with local people and visiting Vietnam Japan IT Cooperation Club to have a discussion with its workers. From these experiences, the participants extracted issues and proposed ways to resolve them. In the result presentation session, employees of NTT DATA Vietnam again helped the students by advising them on how to conduct presentations and question-and-answer sessions. It was a great opportunity in which the powers of Japan and Vietnam joined together towards the same goal. We will strive to continue to offer such opportunities to help develop IT human resources that have a global perspective.

Preparing for the Results Presentation Session

■ North America
Offering Educational Opportunities in India   [ESS]

NTT DATA Services offers educational opportunities in India through various programs. More than 2,200 employees have participated in volunteer activities and helped more than 17,000 children. In fiscal 2018, teaching materials for science, Tamil, English, and mathematics were developed and provided to public schools, bicycles were donated to help children get to school, and basic computer literacy and Internet search classes were offered.

▶ List of Social Contribution Activities

Region	Company Name (Location of Head Office)	Activities
EMEA and Latin America	NTT DATA UK (United Kingdom)	● Activities related to regional community revitalization (Partnership with the Prince's Trust) ● Activities to support the development of the next generation (Mentoring with female students)
	NTT DATA Germany (Germany)	● Activities to support the development of the next generation (work experience in technology, science, and IT fields for female students) ● Activities related to regional community revitalization (Christmas charity) ● Activities in support of creating new business opportunities (Sponsoring business startups) ● Contribution to environmental conservation by promoting bicycle sharing
	NTT DATA Romania (Romania)	● Support activities for children (Christmas charity for children in orphanages) ● Activities to support improving Romania's education system (Popularization of IT education) ● Activities to support the next generation (Award for local students and supported fashion events) ● Support to the Mathematical Olympiad
	NTT DATA Italy (Italy)	● Activities related to regional community revitalization (Charity marathons and educational support facilities) ● Activities in support of developing the next generation (Programming classes and internships)
	everis (Spain)	● Activities in support of the empowerment of women (Closing gender gaps by IT)
	itelligence (Germany)	● Childcare and nursing care support for employees (Day-care center) ● Activities related to regional community revitalization (Charity marathons) ● Company sports events
Japan, China, and APAC	NTT DATA	● Activities to support next generation (IT Experience for Children) ● Activities to support the Social Technology Officer (STO) Creation Project ● Cleaning of the Toyosu area
	NTT DATA China (China)	● Promotion of employment of individuals with disabilities
	NTT DATA Vietnam (Vietnam)	● Activities to support next generation (Global IT Engineer Training Program) ● APAC Volunteer Week Project (Educational support, donations, and support for the elderly and those with disabilities)
North America	NTT DATA Services (United States)	● Global Volunteer Week (Food donation, tree planting, and support for flood affected region) ● Activities to support next generation (Scholarship program) ● Medical support (Mobile cancer screening vehicles)

Response to Government Policies

We ensure that all political donations made in Japan are conducted in accordance with our Global Compliance Policy and our supply chain CSR procurement guidelines and in strict observance of the Political Funds Control Act. NTT DATA's total domestic political donations during fiscal 2018 amounted to ¥3.5 million.

Environment

The NTT DATA Group is contributing to the greening of its clients and society through IT while making a Groupwide effort to reduce the environmental impact of its own business activities.

NTT DATA Group's Approach

In addressing global environmental issues, it is important to ensure sustainability from a wider perspective that includes responding to climate change and conserving biodiversity. The NTT DATA Group is working to resolve a range of environmental issues. In addition to the "Greening of Our Group," based on an environmentally oriented management approach that gives due consideration to the natural environment in every aspect of its corporate activities, the Group is continuing to promote progressive initiatives in the greening of clients and society as a whole through its products and services. In order to achieve significant results in improving environmental issues, the Company is also aiming to enhance its environmental management while promoting Groupwide "environmental contribution and communication."

Contents

Fiscal 2018 greenhouse gas emissions
232,000 t-CO_2e

Acquired third-party certification
For the **3**rd consecutive year

Ratio of waste for final disposal
0.23%

Environmental Management

In order to further entrench the management of operations with a firm regard to the environment, and maintain our efforts to promote the protection of the environment, we believe it is important to establish a foundation for promoting action and create a framework for environmental management across the Group as a whole.

   With the goal of promoting activities to protect the environment across the Group, the NTT DATA Group has established the Groupwide Organization for Promoting Environmental Protection Activities and remains committed to promoting environmental management based on a PDCA cycle.

Policies and Long-Term Goals

Stance on Environmental Protection

The NTT DATA Group established its Environmental Policies in July 1999. Since then, we have focused not only on reducing the environmental impact of our own activities, through such measures as the announcement of our Environmental Messages beginning in fiscal 2010 and the revision of our Environmental Policies in fiscal 2011, but also on providing environmentally responsible systems and services in our capacity as an information services provider, and participating in activities aimed at reducing the environmental impact of society as a whole.

Environmental Policies of the NTT DATA Group

We believe that, given the increasingly serious nature of global environmental problems, we must address these as management issues and work toward contributions that resolve the environmental problems facing the world and society.

   The NTT DATA Group, which applies IT to create new paradigms, contributes to environmental protection by providing systems and solutions that can replace or alleviate the need for actual movement of people and goods. At the same time, recognizing the major impact of business activities on the environment, we are promoting an ongoing and planned approach to environmental protection so as to realize a society that is in harmony with the earth but enjoys the abundance of modern life.

1. Environmental Considerations in Conducting Business
   The NTT DATA Group is working to lessen the environmental impact of its business activities, setting quantitative goals and targets to the extent possible, and reviewing these periodically as part of an ongoing betterment program.
   (1) We are promoting environmentally responsible system development.
   (2) We are actively carrying out green purchasing.
   (3) We are working to prevent pollution and limit resource use, by implementing policies for saving resources and energy, promoting reuse and recycling, and reducing waste.

2. Meeting Legal Obligations
   In carrying out business activities, we observe all applicable environment-related laws and other agreements and obligations.

3. Raising Awareness
   Through environmental education and environmental and social contribution activities for our employees and partners, we are enhancing and boosting recognition of environmental awareness activities.

4. Promoting Communications
   We work proactively to promote environmental communications to stakeholders both within and outside the NTT DATA Group.

June 2018
Yo Honma,
President and Chief Executive Officer

Environmental Messages

Earth Solutions
Using IT to Resolve Environmental Problems

The NTT DATA Group promotes environmental management that helps resolve environmental issues directly facing Earth and human societies based on its three action plans, which are rooted in its Environmental Policies.

Action Plans

■ Contributing to the greening of our clients and society through IT
- Promote the visualization of environmental impact assessments of the systems and solutions provided by the NTT DATA Group
- Help to reduce society's environmental impact by promoting the creation and expansion of environmental solutions

■ Contributing to the global environment by promoting the greening of the NTT DATA Group
- Steadily reduce CO_2 emissions by the Group by raising the efficiency of and implementing operational improvements to its data centers and by such workstyle innovations as hot-desking
- Implement systematic cuts to paper usage and waste volumes

■ Engaging each employee in thinking about the environment and making his or her own active contribution
- Promote environmental social contribution activities across a range of fields both as an organization and individuals
- Promote proactive environmental communication, within and outside the Group

"The Eco Strategy 2030" Organization for Promoting Environmental Protection Activities

The NTT Group set "The Eco Strategy 2030" with targets for its environmental efforts for the period up to fiscal 2030. As a member of the NTT Group, the NTT DATA Group will also pursue its initiatives under The Eco Strategy 2030.

Realizing a Low-Carbon Future	We will seek to increase the amount of CO_2 emissions reduction in society by our contribution to at least 10 times more than the NTT Group's own emissions.
	We will seek to raise power efficiency per communication data for our telecommunication businesses to at least 10 times higher than in fiscal 2013.
	We will seek to play our part in adaptation to climate change by actively promoting initiatives through all our activities. Additionally, we will collaborate with our stakeholders.
Implementing Closed-Loop Recycling	We will seek to achieve zero CO_2 emissions with regard to the final disposal ratio for waste discharged from the NTT Group.
Planning a Future of Natural Harmony	We will seek to play our part in preserving ecosystems by actively promoting initiatives through all our activities. We will also collaborate with our stakeholders.

Environmental Management System
Strengthening the Cross-Group Environmental Management System

The NTT DATA Group is building a cross-Group environmental management system centered on the Eco Activity Promotion Committee and the Eco Activity Liaison Committee.

The following fiscal year's targets and policies are set in consideration of the activity status of NTT DATA and each Group company and upon obtaining the approval of the Eco Activity Promotion Committee chairperson. The targets and policies so set are shared with the Eco Activity Liaison Committee, which meets twice each year and whose members include environmental managers and environmental advocates of ISO 14001-certified departments and Group companies. They are also reflected in individual organizational units' targets.

In July 2019, the role of Environmental Management Promotion Office was taken over by the Sustainability Group within the ESG Promotion Department in order to promote sustainable initiatives in the longer term and strengthen cooperation with related departments. In addition, we are reinforcing the Group's environmental management system by assigning environmental supervisors to Group companies that are not yet ISO 14001-certified.

▶ Organization for Promoting Environmental Protection Activities
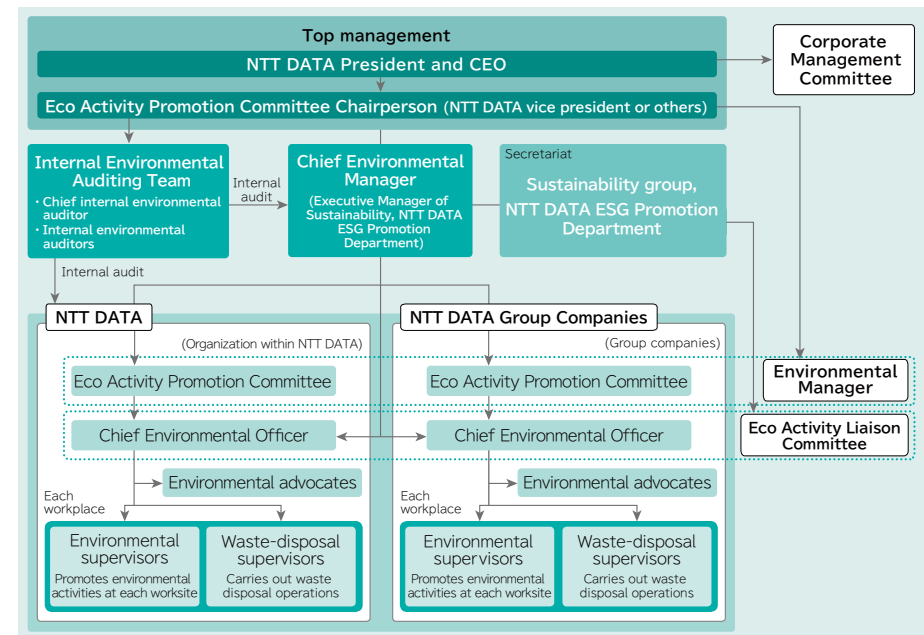
Continuous Improvement Activities Based on ISO 14001 Standards

In April 1998, NTT DATA set up a dedicated unit to establish the Organization for Promoting Environmental Protection Activities and has received ISO 14001 certification for environmental management. We began seeking Group integrated certification in 2004 and have been endeavoring to extend the scope of our environmental management system to the entire Group. In November 2017, we completed our transition to ISO 14001:2015 and are endeavoring to strengthen our environmental initiatives.

As of March 31, 2019, a total of 34 Group companies, including NTT DATA, had attained ISO 14001 certification. Of this total, 29 companies acquired Group integrated certification, while five companies gained independent certification. As a result, the environmental management system's coverage rate of sales totaled 63%, with 51% by Group integrated certification and 12% by independent certification.

▶ Status of ISO 14001 Certification (As of March 31, 2019)

NTT DATA Group Entities That Have Acquired Certification	
NTT DATA Corporation	NTT DATA SOFIA Corporation
NTT DATA HOKKAIDO Corporation	NTT DATA SEKISUI SYSTEMS Corporation (Osaka Head Office, Tokyo Head Office)
NTT DATA TOHOKU Corporation	NTT DATA MANAGEMENT SERVICE Corporation (Head Office, Tokai Branch, Kansai Branch)
NTT DATA SHINETSU Corporation	NTT DATA UNIVERSITY Corporation
NTT DATA TOKAI Corporation	NTT DATA BUSINESS SYSTEMS Corporation
NTT DATA HOKURIKU Corporation	NTT DATA INTELLILINK Corporation
NTT DATA KANSAI Corporation	NTT DATA DAICHI Corporation
NTT DATA CHUGOKU Corporation	NTT DATA CUSTOMER SERVICE Corporation (Head Office)
NTT DATA SHIKOKU Corporation (Head Office, Kagawa Office)	NTT DATA INSTITUTE OF MANAGEMENT CONSULTING, Inc.
NTT DATA KYUSHU Corporation	NTT DATA WAVE Corporation
NTT DATA i Corporation	JSOL Corporation (Tokyo Head Office)
NTT DATA SYSTEM TECHNOLOGIES INC.	DACS Co., Ltd. (Head Office, Tokyo Branch, Osaka Data Center, BPO Center)
NTT DATA FINANCIAL CORE Corporation	NTT DATA CCS CORPORATION (Head Office, Data Center)
NTT DATA FRONTIER Corporation	NTT DATA NJK Corporation (Head Office)
NTT DATA SMS Corporation	
NTT DATA Group Entities That Have Acquired Certification Independently	
NTT DATA MSE CORPORATION	NTT DATA UK Limited
CATS CO., LTD.	Everis Participaciones, S.L.U.
Japan Information Processing Service Co., Ltd. (JIP)	

Internal Environmental Audits
Improving Activity Levels through Periodic Internal Environmental Audits

The NTT DATA Group periodically conducts internal environmental audits to confirm conformance with ISO 14001 specifications and PDCA cycle functionality.

In fiscal 2018, we conducted an actual audit carried out by external experts and internal environmental auditors from organizations other than the one being audited. In addition, internal environmental auditors conducted an environmental audit of their own organizations on a self-audit basis. We hold meetings before and after audits to confirm important audit items and the status of group wide environmental management systems, as well as to share suggestions, improvements, and other information as part of a drive to bolster the levels of internal environmental auditing and Group environmental protection activities.

▶ Results of Internal Environmental Audits for Fiscal 2018

Term of Implementation	July 7 to July 25, 2018
Target organization/company	● NTT DATA Actual inspection: 9 organizations Self-audit: 39 organizations
	● Group companies Actual inspection: 12 companies
Audit results	● Actual audit: 1 serious case, 4 minor cases, 8 observations, 40 recommendations
	● Self-audit: No serious case, 5 minor cases, 6 observations, 5 recommendations

Training Internal Environmental Auditors

The NTT DATA Group has expanded the scope of ISO 14001 certification, maintaining consummate systems to foster internal audit staff (105 staff members as of March 31, 2019).

In fiscal 2018, internal environmental auditors reviewed the environmental assessments conducted by each organization and Group company at the start of the fiscal year to enhance the quality of the assessments as well as to improve the competence of internal environmental auditors. To enable us to implement internal audits in accordance with ISO 14001:2015, we also held practical study groups for our internal environmental auditors.

In order to enable more effective internal audits, our experienced auditors are passing on their expertise while we endeavor to more firmly establish our commitment to ISO 14001:2015 policies by enhancing the abilities of our internal environmental auditors with long-term training, including guidance from outside experts.

Compliance with Laws and Regulations

Periodically Confirming the Status of Compliance with Laws and Regulations

We determine items that require monitoring and measurement with respect to various laws and regulations, including Japan's Law Concerning the Rational Use of Energy (Energy Conservation Act) and Waste Management and Public Cleansing Law, while periodically confirming the status of compliance. Moreover, we address the need to monitor, measure, and report on the volume of CO_2 emissions in accordance with Japan's Law Concerning the Promotion of Measures to Cope with Global Warming and the Ordinance on Environmental Protection issued by the Tokyo metropolitan government. Furthermore, in fiscal 2018 we committed no violations of environmental regulations.

▶ Major Laws and Regulations and the Scope and Number of Facilities Impacted in Fiscal 2018

Major Laws and Regulations	Target Items	Number of Facilities Impacted
Energy Conservation Act	Facilities using 3,000 kl/year or more (crude oil equivalent)	11
	Facilities using 1,500 kl/year or more (crude oil equivalent)	5
Air Pollution Control Act	Smoke-generating facilities	4
Water Quality Pollution Control Act	Number of oil storage and other facilities	60
Sewerage Service Act	Facilities generating 50 m³ or more of wastewater per day	3

Environmental Education

Conducting Business- and Role-Specific Environmental Education

The NTT DATA Group conducts various environmental education activities to help employees properly understand the significance and purpose of environmental protection and environmental management based on ISO 14001 standards. These activities are also aimed at raising awareness toward environmental issues. Our efforts span an e-learning curriculum that covers the basics of CSR and environmental education, courses for waste-disposal supervisors, environmental managers, environmental advocates, and environmental supervisors, as well as education programs customized for each organization and business function.

To encourage an understanding of and promote environmentally oriented management, we are extending CSR and environmental education on the basics of environmental conservation beyond ISO 14001-certified companies to include all Group companies in Japan.

In fiscal 2018, we introduced some examples of how we contributed to the achievement of SDGs through our business activities. These examples provided employees with an opportunity to think about the connections between our operations and CSR.

We intend to maintain our efforts to enhance the content in fiscal 2019 by adding the latest topics.

▶ Number of Employees Who Have Taken e-learning Courses in Fiscal 2018

Name of Training Session	Number of participants
CSR and environmental education	38,430
Course for environmental managers, environmental advocates, and environmental supervisors	718
Course for waste-disposal supervisors	635

Environmental Contributions and Communication

Promotion of Social and Environmental Contribution Activities

In accordance with the promotion of awareness activities set forth in the NTT DATA Group's environmental policies, we strive to raise awareness on environmental issues by educating our employees and temporary staff through social and environmental contribution activities. To promote participation in these activities across all organizations, we have been continuously setting yearly targets for participation numbers since fiscal 2010.

In fiscal 2018, each Group company cooperated, sharing information and actively engaging in the activities, and we achieved a total of 5,634 participants.

We will also continue to proactively participate in events held in each region in 2019, including cleanup activities around office buildings.

Environmental Impact

Targets for Fiscal 2019 and Onward (Medium-Term Targets)

The NTT DATA Group establishes three-year medium-term targets as part of its ongoing ISO 14001 improvement activities and reviews those targets each fiscal year against results.

Since fiscal 2009, we have promoted the greening of clients, society, and our Group while engaging in environmental contribution activities and increasing communication. We have established targets for our environmental activities attuned to this shift in direction.

With the goal of further raising environmental targets, we revised the focus of our target CO_2 emissions indicator from the basic units of sales value to total CO_2 emissions and amended the measurement criteria of our indicator for waste material from zero CO_2 emissions of industrial waste to the final disposal rate of waste as a whole in fiscal 2012. Starting in fiscal 2018, we will use fiscal 2013, instead of fiscal 2008, as a reference year when setting environmental targets. The entire NTT DATA Group continues to work toward reducing its environmental impact in order to meet these targets.

▶ Targets for Fiscal 2019 and Beyond

Scope	Target Definitions	Fiscal 2018 Results	Fiscal 2019	Fiscal 2020	Fiscal 2021
Reduce the environmental impact of society through the promotion of green IT	Through its contributions, the NTT Group will seek to increase the reduction of CO_2 emissions in society to at least X times more than the amount of its own emissions.	4.5 times	4 times or more	4 times or more	4 times or more
Reduce greenhouse gas (GHG) emissions	GHG emissions	5% reduction	5% increase or less	0% reduction or more	0% reduction or more
Reduce the amount of copy paper purchased	Amount of copy paper purchased (Gross amount calculated on a number-of sheets basis)	34.1% eduction	4% reduction or more	4% reduction or more	4% reduction or more
Reduce the amount of waste for final disposal	Amount of waste for final disposal (Gross amount)	94% eduction*1	80% reduction or more*1	80% reduction or more*1	80% reduction or more*1
	Ratio of waste for final disposal (Final disposal amount / total amount of waste)	0.23%*1	1.0% or less*1	1.0% or less*1	1.0% or less*1
Social and environmental contribution activities	Number of activity participants	5,634	4,700 or more	4,800 or more	4,900 or more

*1: Figures for amount of waste for final disposal exclude effective utilization of thermal energy (thermal recycling) generated by incineration at final disposal.

Fiscal 2018 Target Attainment Status

The figures are based on data collected from NTT DATA Group companies that have acquired Group integrated ISO 14001 certification. The scope of data collection for some achievements is being expanded along in line with the expansion of environmental management.

▶ Group Targets and Results in Fiscal 2018

(Scope of data: NTT DATA and 29 Group companies in Japan that have acquired Group integrated ISO 14001 certification, except for greenhouse gas reduction results for fiscal 2018 (*1), where data were collected from NTT DATA and 69 Group companies in Japan including the 28 companies)

Scope	Target Definitions	Base Value (Base fiscal year: 2013)	Fiscal 2018 Target	Value	Results
Reduce the environmental impact of society through the promotion of green IT	Through its contributions, the NTT Group will seek to increase the reduction of CO_2 emissions in society to at least X times more than the amount of its own emissions.	—	4 times or more	4.5 times*1	○
Reduce greenhouse gas (GHG) emissions	GHG emissions	244,081 t	5% increase or less (256,285 t or less)	5% reduction*1 (232,221 t)	○
Reduce the amount of copy paper purchased	Amount of copy paper purchased (Gross amount calculated on a number of sheets basis)	201,220,000 sheets	4% reduction or more (193,170,000 sheets or less)	34.1% reduction (132,640,000 sheets or less)	○
Reduce the amount of waste for final disposal	Amount of waste for final disposal (Gross amount)	207 t	80% reduction or more (41 t or less)	94% reduction (11.6 t)	○
	Ratio of waste for final disposal (Final disposal amount / total amount of waste)	—	1.0% or less	0.23%	○
Social and environmental contribution activities	Number of activity participants	—	4,600 or more	5,634	○

Overview of the NTT DATA Group's Environmental Impact

We believe that the reliable and continuous achievement of our goals to reduce the NTT DATA Group's environmental impact is a fundamental responsibility of our environmental activities. We believe that the reliable and continuous achievement of our goals to reduce the NTT DATA Group's environmental impact is a fundamental responsibility of our environmental management efforts. To minimize the environmental impact of its business activities, the NTT DATA Group monitors and analyzes the types and amounts of resources and energy consumed by various processes and their environmental impacts.

The environmental impact posed by the NTT DATA Group's business activities primarily arises from the emission of greenhouse gases resulting from the consumption of energy, mainly as electric power. However, there are many other factors that affect the environment, including data center construction and the use of paper and water resources. In addition, we cannot ignore the environmental impact of energy consumption resulting from the operation of systems and services provided by the NTT DATA Group by clients. The NTT DATA Group strives to correctly ascertain and analyze the environmental impact of its business activities and to utilize these results in various improvement activities.

▶ Material Flow Diagram

INPUT

Inside the NTT DATA Group   ☐ Acquired third-party certification

Energy

	Unit	Fiscal 2015	Fiscal 2016	Fiscal 2017	Fiscal 2018
Utility power	10,000 kWh	47,661	49,437	48,063	47,678
Kerosene	kl	16	0	29	0
Light gas oil (excluding Company vehicles)	kl	25	68	40	30
A–C heavy oil	kl	0	20	237	126
City gas	10,000 ㎥	142	175	172	141
Gasoline (Company vehicles)	kl	623	632	664	612
Light gas oil (Company vehicles)	kl	21	24	29	26
Steam, cold energy	GJ	41,372	43,388	48,223	48,811

Water resources

	Unit	Fiscal 2015	Fiscal 2016	Fiscal 2017	Fiscal 2018
Clean water consumption*1	10,000 ㎥	34	55	58	62

Paper resource

	Unit	Fiscal 2015	Fiscal 2016	Fiscal 2017	Fiscal 2018
Copy paper	t	866	805	746	671
Fliers distributed to clients, and other materials	t	54	30	19	18

Specified chlorofluorocarbons (CFCs) used for air-conditioning systems

	Unit	Fiscal 2015	Fiscal 2016	Fiscal 2017	Fiscal 2018
Number of air-conditioning system units using specified CFCs	Units	25	86	83	8

Construction materials

Construction materials, cables, etc.

* Fiscal 2016 figure for copy paper was corrected by making up data deficiencies.

Process flow: Sales → Planning / Design → Manufacturing / Testing → Data center → Installation at client sites

OUTPUT

Inside the NTT DATA Group   ☐ Acquired third-party certification

Greenhouse gases

	Unit	Fiscal 2015	Fiscal 2016	Fiscal 2017	Fiscal 2018
Electricity use	10,000 t-CO₂e*2	23.4	24	22.7	22.4
Gas / Fuel use	10,000 t-CO₂e	0.3	0.4	0.5	0.4
Heat use	10,000 t-CO₂e	0.2	0.2	0.3	0.3
Company vehicle use	10,000 t-CO₂e	0.1	0.2	0.2	0.2
Alternative CFCs	10,000 t-CO₂e	—	0.3	0.0	0.1
Total	10,000 t-CO₂e	24.1	25.1	23.6	23.2

Water resources

	Unit	Fiscal 2015	Fiscal 2016	Fiscal 2017	Fiscal 2018
Drainage amount	10,000 ㎥	24	27	23	29

Office waste

	Unit	Fiscal 2015	Fiscal 2016	Fiscal 2017	Fiscal 2018
Amount generated	t	4,763	5,865	4,573	5,305
Incineration / Landfill	t	64	65	68	43
Amount recycled	t	4,685	5,800	4,505	5,262
Amount of final disposal*3	t	13	24	24	17

Construction waste*4,*5

	Unit	Fiscal 2015	Fiscal 2016	Fiscal 2017	Fiscal 2018
Amount generated	t	36,512	11	1,118	1,795
Amount recycled	t	36,473	11	1,083	1,788
Amount of final disposal	t	39	0	35	8

Outside the NTT DATA Group

Energy → Service operation at client sites → Greenhouse gases (CO₂)

Scope of Environmental Impact Measurement
Fiscal 2015: NTT DATA (all organizations), 75 Group companies (Japan only)
Fiscal 2016: NTT DATA (all organizations), 69 Group companies (Japan only)
Fiscal 2017: NTT DATA (all organizations), 68 Group companies (Japan only)
Fiscal 2018: NTT DATA (all organizations), 68 Group companies (Japan only)

*1: "Clean water consumption" until fiscal 2017
*2: Indicates CO₂ equivalent
*3: Thermal recycling has been taken into consideration for the calculation of data since fiscal 2015.
*4: Figures for fiscal 2015 increased due to the demolition of a large-scale building.
*5: Figures for fiscal 2017,2018 increased due to construction of new buildings, etc.

Environmental Accounting

Aiming to Conduct Efficient and Effective Environmental Preservation Activities

In fiscal 2018, Group environmental cost comprised ¥42 million in investments and ¥351 million in expenses.

The business area costs for resource recycling (investments) increased compared with fiscal 2017 as a result of promotion of paperless initiatives such as the introduction of electronic conference systems.

▶ Environmental Accounting Conservation Cost
(Scope of data: All organizations of NTT DATA and 68 Group companies (Japan only)) Unit: millions of yen

Ministry of the Environment's Environmental Accounting Guideline Categories		Major Initiatives	Fiscal 2015		Fiscal 2016		Fiscal 2017		Fiscal 2018	
			Investment	Expenses	Investment	Expenses	Investment	Expenses	Investment	Expenses
Business area costs			6	187	121	51	0	216	42	144
	Pollution prevention costs	Asbestos countermeasures, PCB management, etc.	0	21	120	1	0	54	0	6
	Global environment	Implementation of energy conservation measures; measures to reduce CO2 emissions through the introduction of outdoor-air cooling devices; elimination of specified CFCs in air-conditioning equipment, etc.	0	0	0	0	0	0	0	0
	Resource recycling costs	Inter-office waste disposal, construction waste countermeasures, office paper curtailment countermeasures, etc.	6	167	1	50	0	163	42	138
Upstream / Downstream costs		Compliance with the Act on the Promotion of Sorted Collection and Recycling of Containers and Packaging	0	1	0	0	0	0	0	0
Activity management costs		Labor costs related to environmental protection activities, ISO certification acquisition, building greening, environmental PR, etc.	0	261	0	262	0	255	0	204
R&D costs		Environment-related R&D	0	0	0	0	0	0	0	0
Citizen activity costs		Environmental contribution to regional communities	0	1	0	0	0	1	0	2
Total			6	449	121	313	0	472	42	351

Addressing Climate Change

The rising concentration of greenhouse gases and other factors are impacting the climate in ways that have led to the increased severity and frequency of natural disasters such as typhoons and floods while also significantly impacting everyday life across society and industry. In December 2015, the Paris Agreement, which serves as a new international framework for global warming countermeasures beyond 2020, was adopted at the 2015 United Nations Climate Change Conference (COP21). Addressing climate change was also included in the United Nations SDGs adopted in September 2015. As illustrated by these developments, response to climate change in terms of mitigation and adaptation has gained even greater significance as a common global concern. The NTT DATA Group is pursuing strategic initiatives through its business with the intention of offering a more effective response to climate change.

TCFD recommendations	Page(s) on which the information is disclosed
[Governance] Disclose the organization's governance around climate-related risks and opportunities.	
a) Describe the board's oversight of climate-related risks and opportunities.	P74 Climate Change Strategy
b) Describe management's role in assessing and managing climate-related risks and opportunities.	P74 Climate Change Strategy
[Strategy] Disclose the actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning where such information is material.	
a) Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.	P75-79 Risks and Opportunities
b) Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning.	P75-79 Risks and Opportunities
c) Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2℃ or lower scenario.	—
[Risk management] Disclose how the organization identifies, assesses, and manages climate-related risks.	
a) Describe the organization's processes for identifying and assessing climate-related risks.	P75-79 Risks and Opportunities
b) Describe the organization's processes for managing climate-related risks.	P75-79 Risks and Opportunities
c) Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management.	P74 Prioritization of Risks
[Metrics and targets] Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.	
a) Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process.	P74 Prioritization of Risks
b) Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.	P80 Managing Greenhouse Gas Emissions across the Supply Chain
c) Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.	P71 Fiscal 2018 Target Attainment Status

* Prepared by the Company based on the Recommendations of Task Force on Climate-related Financial Disclosures (Final Report), 2017, page 14.

Climate Change Strategy

Company Level

The Representative Director and Senior Executive Vice President, who serves as the Eco Activity Promotion Committee Chairperson as well as the manager of core corporate activities including business strategy, risk management, IR and so on, has the highest executive responsibility for climate change matters. The Eco Activity Promotion Committee Chairperson, who concurrently holds the post of Chief Risk Officer, semiannually checks risk management related to climate change as part of company-wide risk management. The sustainability group is responsible for the specific assessment of climate change risks and opportunities and strategic planning.

The sustainability group evaluates the business and financial impact of regulatory trends (including carbon taxes, purchase schemes for renewable energy, and cap-and-trade systems) and physical effects (including abnormal weather and rise of average temperature). The group also monitors the progress of measures to address risks and opportunities deemed by the team as material as a result of the evaluation and analyzes targets and results of environmental load measurements (energy consumption/greenhouse gas emissions, paper resource usage, waste material volumes, and water usage). The results of these evaluation and analysis are reported to the Eco Activity Promotion Committee Chairperson. The Chairperson then proposes critical matters for consideration to the Board of Directors, where discussions are held regarding possible response measures. In the 2018 report, the Board of Directors reviewed the risk assessment items and decided to assess climate change risks, which had been evaluated only as part of another risk item, as an independent assessment item from the next fiscal year.

Asset Level

The Facility Management Division, which has expertise in building design, compiles information on environmental load indicators for each data center and office (energy consumption/greenhouse gas emissions, paper resource usage, waste material volumes, and water usage), the status of energy conservation measures, and regulatory trends at the local government level, and reports its findings to the sustainability group. If the team deems that any reported matter is likely to significantly impact the Company's business, it reports this matter to the Eco Activity Promotion Committee Chairperson. The Chairperson then proposes critical matters for consideration to the Board of Directors, where discussions are held regarding possible response measures.

Prioritization of Risks

The Internal Control Promotion Committee, which is responsible for company-wide risk management, identifies about 40 business-related risks at the Head Office, regional integrated companies, and individual Group companies. The committee then evaluates each risk identified, using a matrix with one axis being the magnitude of impact (very large, large, medium, small) and the other axis being the probability of occurrence (very high, high, medium, and low). Risks with very large/large impact and very high/high/medium probability, or risks with very large/large/medium impact and very high/high probability are defined as "material risks" and prioritized by each company around the globe. In addition, risks determined to have the potential to impact the entire Group are defined as global-control risks and are managed stringently and thoroughly on a Groupwide basis. Risks determined by each regional integrated company as material risks are also defined as "region-control risks" and undergo an evaluation and improvement cycle based on the progress of measures, risk occurrence status, and other conditions. Under this Groupwide risk management system, climate change risks are categorized as a kind of region-control risks that multiple companies are facing.

Offices

We are reducing CO_2 emissions volume by approximately 13,300 t-CO_2e each year by efficiently operating office facilities through efforts such as optimizing the operation of air supply and exhaust systems and optimizing the number of air conditioners and hours of operation.

Products and Services

The NTT DATA Group builds and operates environmentally friendly Green Data Centers. In March 2018, we completed construction on Mitaka Data Center EAST, a collective of key elements of the services offered by our Green Data Centers, including high voltage direct current (HVDC) power supply systems[1], virtualization technologies, and air current control systems for cooling. Mitaka Data Center EAST shortened operating times for air-conditioning equipment by installing an outside air-cooling system that utilizes natural energy. We are aiming to be in Japan's top class of energy-efficient companies with a PUE[2] of 1.3 or less (annual average, design value). In September 2018, Mitaka Data Center EAST obtained Gold certification in the data center category under the latest version (version 4) of the Leadership in Energy and Environmental Design (LEED) rating system. It is the first[3] data center facility in Japan to have obtained the certification.

*1: This is an electrical power system that supplies a direct current (DC) straightaway to IT devices by only conducting one conversion. Previous power supply systems received power through an alternating current (AC) and then later conducted three AC–DC conversions, twice through an uninterruptable power supply and once inside of the IT device.
*2: Power usage effectiveness: An indicator that expresses the electricity consumption efficiency of data centers.
*3: First in Japan in U.S. Green Building Council's project category "LEED BD + C; Data Centers"

Risks and Opportunities Related to Climate Change

Transitional Risks

Compliance with climate change regulations presents transitional risks of increased costs for actions such as facility upgrades and additional operational functions.

Because of electricity usage accounts for nearly all of CO_2 emissions of NTT DATA Group due to the characteristics of our businesses, we envisage a need to procure energy from sustainable sources to continue our business. However, as the potential for generating renewable energy and the certificate trading system in Japan are currently underdeveloped, achieving this is extremely difficult. Also, there are concerns that domestic regulations will be substantially strengthened, increasing the cost burden associated with CO_2 emissions and seriously hindering business continuity. If we were forced to switch to renewable energy all at once at current electric power consumption levels, the estimated cost increase would be at least ¥2.8 billion. In response to these types of risks, the NTT DATA Group has been installing renewable energy-based private power generation equipment at its Company buildings. In March 2018, we completed construction on Mitaka Data Center EAST, which has adopted an outside air-cooling system that utilizes photovoltaic power generation and natural energy (outdoor air during the spring, fall, and winter), bringing our total number of buildings with photovoltaic power equipment to three. Currently, two of our other buildings are also utilizing low-carbon energy, participating in district cooling and heating (DHC) systems. Installation costs for renewable energy-based private power generation equipment (excluding costs at Mitaka Data Center EAST) and DHC system participation costs at our other two buildings add up to roughly ¥700 million. Going forward, we will move incrementally forward with the switchover to renewable energy and other low-carbon energy sources. Our current renewable energy generation capacity is 221 MWh.

Furthermore, under the Tokyo metropolitan government's Ordinance on Environmental Preservation, large facilities are required to reduce total CO_2 emissions from energy usage and to participate in a cap-and-trade program of emissions trading. A total of seven NTT DATA Group buildings in Tokyo are subject to the ordinance, which presents the risk of increased operating costs due to measures aimed at complying with the ordinance. Estimated costs associated with this ordinance are expected to amount to approximately ¥100 million between 2015 and 2019. (Calculations for the second compliance period were based on the need to purchase 10,000 t-CO_2e of credits (certificates) priced at ¥10,000/t-CO_2e. However, we anticipate that we will be able to partly offset these costs against surpluses from the first compliance period.) To manage this risk, we are implementing measures such as upgrading to highly efficient electrical equipment and air-conditioning equipment and enhancing operation of air-conditioning, lighting, and other shared facilities. The cost of addressing this risk for the period between fiscal 2017 and fiscal 2018 was approximately ¥700 million. As a result of these efforts, total CO_2 reductions for fiscal 2018 were

40,577 t-CO_2e, a reduction rate of approximately 26%.

Additionally, the NTT DATA Group is working to find solutions to societal issues, such as climate change, through its business operations and is implementing progressive and environmentally superior workstyles. These efforts have led to high third-party praise regarding our ESG (we have been selected for inclusion in the DJSI World Index), as well as to high employee satisfaction and retention rates (turnover rate of 3.6%, lower than the telecommunications industry average of 10.5%). We estimate that we would suffer an approximately ¥62.2 billion decrease in annual income if the third-party praise we receive concerning our ESG and our employee satisfaction rates were to fall to industry-standard levels (calculated by multiplying the increase of turnover by net sales per employee).

In response to these types of risk, we conduct annual employee training regarding global trends in climate change and the NTT DATA Group's response to them. Furthermore, we have distributed information access devices for teleworking to employees, allowing for flexible workstyles at home or in satellite offices. Expenses for education and training aimed at raising employee expertise are approximately ¥7.8 billion, while our distribution of information access devices for teleworking incurs annual running costs of roughly ¥1.1 billion.

Risks Driven by Physical Impact

With regard to physical impact caused by climate change, there is a risk that abnormal weather phenomena such as large typhoons, flooding, heatwaves, and torrential rains could shut down the power supply to data centers, while flooding and lightning could halt operations at the data centers. Some 50% or more of the NTT DATA Group's sales are connected with its data centers, and its main data centers are located on middle latitudes in the northern hemisphere, which are frequently experiencing heavy rainfall due to climate change. Due to these unique characteristics, suspensions of operations at our data centers could have severe impacts on our business, and could also negatively impact large-scale systems that support social infrastructure, such as financial and medical services. For these reasons, operational suspensions at our data centers carry the risk of causing enormous damage to society at large.

With these factors in mind, the NTT DATA Group has equipped its data centers with in-house emergency generators in readiness for power outages. However, if these generators halt operations due to flooding, there is a risk that our data center business continuity may be jeopardized. Operation of our data centers could also be interrupted by malfunctions in equipment caused by lightning strikes. One day of operational suspension would result in approximately ¥3.2 billion in lost sales (calculated based on the daily sales rates of services provided through our data centers). In reality, we would suffer further damages, such as a decline in trust, so this figure is actually the lowest value that could be expected. We have been taking various measures to avoid these risks,

such as: (1) identifying data centers where basements present high flood risk based on municipal hazard maps and implementing flood prevention works; (2) establishing back-up data centers in multiple locations; and (3) upgrading lightning rods at 15 NTT DATA buildings nationwide. In fiscal 2017, we conducted drills in preparation for disasters on the same level as the 2016 Hakata road cave-in incident, including natural disasters caused by climate change and other factors. We also reconsidered the required amounts of fuel and water and strengthened our procurement methods. In fiscal 2018, we conducted drills with a scenario where a disaster occurs outside weekday daytime hours and introduced our own system that can be accessed from home and mobile phones on the occurrence of a disaster.

As average global temperatures rise, our increasing responsibility to provide air conditioning at our data centers also carries the risk of rising energy costs. These rises carry the risk of inviting increases in operational costs because the NTT DATA Group possesses data centers located in countries all over the world, including 17 inside Japan and others in the EU and United States, that are situated on middle latitudes in the northern hemisphere, where rises in average temperature are considerable.

We estimate that a temperature rise of 1°C in NTT DATA's data centers in Japan would increase electricity usage by 5.4 million kWh, hiking energy costs approximately ¥80 million. To respond to these types of risk, we are converting electrical and air-conditioning systems to high-efficiency equipment and are promoting improvements in the operation of both air-conditioning and lighting systems, as well as other common utilities. At the NTT DATA Mitaka Building, for example, in addition to the above measures, we have reduced electricity consumption by approximately 30% compared to our conventional data centers by installing photovoltaic power generation systems and HVDC power supply systems. Furthermore, we completed construction on Mitaka Data Center EAST, which adopted an outside air-cooling system that uses natural energy other than photovoltaic power generation (outdoor air in the spring, fall, and winter), in March 2018. The costs of upgrading facilities and enhancing operations at all NTT DATA Group data centers in Japan totaled approximately ¥4.9 billion for the period between fiscal 2012 and fiscal 2018.

Other Risks

Risks driven by changes in other climate-related developments include increased investor requests for corporate information disclosure related to climate change, declines in share price associated with lower evaluation by investors, and deterioration in market-imposed financing conditions.

As of March 31, 2019, 15.45% of NTT DATA Group stock was held by overseas corporations, and lower evaluation by overseas investors actively engaged in ESG investment carries the risk of a decline in share price that would decrease corporate value. Financial institutions in Japan own 20.95% of our stock, and a portion of them have begun engaging in ESG investment. For this reason, according to speculations, if financial institutions in Japan were to lower their evaluations of our ESG moving forward, the impact from this would lead to falling stock prices, and would ultimately affect our corporate value negatively. If the price of shares held by overseas investors were to fall by 0.1%, the impact on the Company's market capitalization would amount to approximately ¥293 million[1].

Accordingly, we actively disclose information to investors, particularly concerning CDP[2], on which investors who request Company information regarding climate change place particular importance. We have been offering responses regarding CDP since 2009. From fiscal 2013 to fiscal 2018, we have been actively disclosing information on matters including climate change by participating in a Ministry of the Environment project to develop infrastructure for environmental information disclosure systems, which is intended to construct an information platform that enables institutional investors in Japan to utilize ESG data.

Expenses related to investor requests for corporate information regarding climate change are about ¥20 million. The NTT DATA Group's climate change response measures simultaneously carry both business risks and aspects of securing business opportunities. We are aiming for the realization of sustainable societies and our own growth as a company by providing IT services that offer solutions for societal issues related to climate change, such as impact alleviation and adaption.

[1]: Calculated on the basis of 1,402,500,000 outstanding shares as of March 31, 2019
[2]: CDP was launched in 2003 by a U.K.-based NGO to evaluate the climate change policies of businesses and enterprises. (Formerly the Carbon Disclosure Project)

Opportunities Related to Products and Services

As the strengthening of regulations in pursuit of realizing a zero CO_2 emissions society by 2050 is likely to accelerate, we expect increases in demand for more efficient IT systems, which account for a significant proportion of corporate energy consumption. Specifically, we forecast growth in outsourcing demand for consolidated Kyodo Center with high energy efficiency, and streamlined and virtualized IT systems. Out of the NTT DATA Group's total sales of ¥2,163.6 billion, domestic and international local governments and central government agencies, including the Japanese Cabinet Secretariat and Ministry of the Environment, account for about 18%, while financial institutions, including those compliant with TCFD[3] recommendations, account for roughly 23%. As a company developing and operating so many large-scale and mission-critical systems, we are working to make our data centers greener, which will help us to realize large-scale reductions in energy consumption. We are accomplishing this by promoting Green Data Center services that are aimed at reducing environmental impact through integration of IT and facilities technologies. Data centers and their related services are an ¥57.0 billion business (as of March 31, 2019), and we believe that they will grow into an ¥62.0 billion business in fiscal 2020 due to demand for outsourcing to energy-efficient data centers.

As for HVDC power supply systems, we realized a data center with DC power supply in a customer environment for the first time in the world. In 2015, we built a data center that runs on DC power at our own Shinagawa TWINS Building as well. During the same year, we were awarded the Minister of the Environment Award for "Joint Technological Developments Related to Drastically Low-Carbon Data Centers and Waste Heat Utilization in Offices, etc." In March 2018, we completed construction on Mitaka Data Center EAST, a compilation of HVDC power supply systems, virtualization technologies, and air current control systems for cooling, which are the main elements of our Green Data Center services. This data center reduced air-conditioning equipment operation time by adopting an outside air-cooling system that utilizes natural energy. We are aiming to join Japan's top class of energy-efficient companies by achieving an annual average PUE of 1.3 or less. In September of the same year, we obtained Gold certification in the data center category under the LEED environmental rating system. Our total research and development expenses for component technologies of green data centers, including AI/IoT, deep learning, and virtualization technologies, totaled ¥15.1 billion.

The accelerating use of cloud-based data centers, which offer high level of safety and protection of corporate data from being lost in abnormal weather phenomena such as typhoons or localized torrential rain, also offers new business opportunities. For example, our joint-use enterprise systems, such as the Chigin Kyodo Center (BeSTA®) for regional banks, have gained a top market share of roughly 30%, while more than 90% of credit associations across Japan are using our comprehensive online Shinkin Kyodo System. We also utilize cloud-based highly scalable, available, and flexible platforms to provide our own AW3D® Global High-Resolution 3D Map, which is the world's first 3D mapping technology that can display global topography at a resolution and accuracy of five meters. The map allows us to contribute in various ways to climate change adaptation, such as the creation of tsunami hazard maps in Macau and the selection of wind power generator installation sites in nations across the world. The map is also used in more than 115 countries worldwide for more than 900 projects that stretch across a wide range of fields, including infrastructure maintenance, natural disaster countermeasures, and global warming response. We believe that accelerating demand for cloud computing services will enable us to further expand our business. The NTT DATA Group's cloud computing services sales were ¥585.0 billion in fiscal 2018.

The NTT DATA Group is creating business opportunities through its cloud-related services. We offer joint-use platform services tailored to customer requirements ranging from infrastructure services (data centers) to applications. Furthermore, we provide comprehensive construction and operation services for establishing private clouds with existing consolidated centers. For example, our "BIZXAAS Office" service, which provides systems required for an office environment via cloud computing, has been deployed in-house to promote telecommuting and set up satellite offices as part of BCPs. In 2017, we launched efforts to consolidate the NTT DATA Groupwide development environment in an "integrated development cloud" with the aim of expanding and deploying it in 100% of all new domestic development projects from March 2019. Between fiscal 2009 and fiscal 2016, we have invested more than ¥10.0 billion in cloud computing services.

Elsewhere, optimization of social infrastructure is picking up speed due to the sense of impending crisis associated with climate change and rising energy costs. The NTT DATA Group is distinguished by its ability to conduct complicated and large-scale project management, and demand and opportunity for efficient infrastructure construction utilizing IT, such as smart grids, to prevent transmission loss are increasing in the field of electricity. NTT DATA was chosen as a partner business in Tokyo Electric Power Company's Request for Proposals for a Smart Meter Operation Management System in May 2013. In 2014, we also received orders from The Chugoku Electric Power Company, Inc., for a smart meter operation management system and from the Organization for Cross-Regional Coordination of Transmission Operators, JAPAN for a wide-range switching support system. As of September 2017, our development system had produced 13 million smart meter operation management system units in Tokyo Electric's sales area. In 2020, we aim to increase that number to 29 million.

For the five years beginning in 2017, the NTT Group is aiming for cumulative sales of ¥10.0 billion for all electricity retail liberalization services.

In April 2016, we began offering our ECONO-CREA® cloud service to power companies along with the liberalization of the electricity retail industry. This, along with our customer management services and supply–demand management services, are currently utilized by more than 10 new power companies. While aiming for the same system's standardization across the industry, we are accumulating expertise regarding the construction of social infrastructure through the use of the smart meter operation management system, which possesses world-leading scale and speed, allowing 13 million meters to be read every 30 minutes.

For fiscal 2018, our total research and development expenses are ¥15.1 billion. They include costs associated with AI and IoT technology, such as the smart meter operation management system, and smart city-related costs used for technologies such as automatic vehicles and simulators that predict and mitigate traffic jams.

*3: Task Force on Climate-Related Financial Disclosures: This privately led task force focuses on securing the disclosure of climate-related financial information and was established under the Financial Stability Board upon request of the G-20's ministers of finance and central bank governors.

Opportunities Related to Resource Optimization

Our promotion of flexible workstyles that are not limited to the workplace, including teleworking (working at home), is one example of the opportunities we create to reduce CO_2 emissions that occur during employee commuting.

NTT DATA is promoting Companywide utilization of teleworking, and a total of 42,600 employees participated in the five Telework Days in 2018. As a result, we received the Diversity Management Selection 100 Prime Commendation from METI. We also received the Chairman's Award, as well as others, from the Japan Telework Association.

Through teleworking and remote access from business trip destinations, we have reduced the necessary amount of commuting and movement between buildings, which has reduced our CO_2 emissions produced through commuting by 9,387 t-CO_2e (57 days of telework per year, or 23% of business days). According to our estimate, reduction benefits were approximated 90 million yen. CO_2 reductions from telecommuting, etc. × transaction price: Calculated at 10,000 yen/ tons-CO_2.

As a strategy for realizing opportunities to reduce CO_2 from commuting by implementing flexible working formats not limited to specific workplaces, like telecommuting, the Company participated in Telework Days mentioned earlier, conducted initiatives to promote use of trials, etc. in system development divisions, consolidated the system development environment on a cloud, and conducted initiatives to realize telecommuting in system development by using an "integrated development cloud", which aims at enhancing production technologies. Telework environment operating costs are a minimum of ¥1.1 billion. Moving forward, through teleworking and remote access from business trip destinations, we will work to reduce CO_2 emissions produced when commuting and moving between buildings.

▶ Risks Related to Climate Change and Natural Disasters

Potential impact on business	With the adoption of the Paris Agreement, demand for compliance with regulations related to climate change is likely to grow stronger moving forward, raising the risk of costs associated with modifying equipment and adding operational functions. Abnormal weather phenomena have also been on the rise in recent years and could possibly cause tremendous damage or have enormously negative impacts on our large-scale systems, which support social infrastructure, by shutting down power supplies to our data centers in Japan and overseas or halting data centers through flooding. As a result of these effects, investor demand for information disclosure regarding climate change would grow, stock prices would fall as evaluations of the Company deteriorated, and terms of financing from the market would worsen.
Initiatives aimed at alleviating risk, etc.	● Response to Risk Driven by Regulations Upgrading electric and air-conditioning units to highly efficient equipment, and response to risks driven by physical impact, such as operational improvements related to air conditioning and lighting ● Response to Risk Driven by Physical Impact 1. Identifying data centers where basements present high flood risk based on municipal hazard maps and implementing flood prevention works 2. Establishing back-up data centers in multiple locations 3. Upgrading lightning rods at 15 NTT DATA buildings nationwide 4. Adding data centers equipped with the latest disaster countermeasures (Mitaka) 5. Ensuring that our emergency power generators can operate for 72 hours in case of power outages and maintaining emergency fuel procurement agreements 6. Enriching teleworking environments that enable continued operations when commuting is not possible (gateway enhancement) ● Other Risk Response We are actively disclosing information related to our CDP to investors. In addition, we are participating in an information platform construction project sponsored by the Ministry of the Environment that will enable institutional investors in Japan to utilize ESG data.

▶ Climate-Related Risks and Opportunities

Risks and opportunities		Risk / opportunity type	Outline	Time horizon[1]	Financial impact of risks and opportunities	Countermeasure costs
Risk 1	Increase in energy costs in Japan caused by a shift to renewable energy	Transition risk	We are expected to maintain our business by procuring power from renewable energy to help achieve the Paris Agreement.	Long term	If we switch all energy currently consumed at the Company to renewable energy, the estimated cost increase will be at least about ¥2.8 billion.	The cost of renewable energy self-generation facilities and the cost of participation in the community cooling and heating systems is approximately ¥700 million.
Risk 2	Increase in cap-and-trade costs under the Tokyo program	Transition risk	Operational costs may increase to reduce our total amount of CO_2 to help achieve the target of the Tokyo Cap-and-Trade Program.	Medium term	If we purchase offset credits for all emissions reductions required to achieve the target for the 2nd period (2015-2019) of the Tokyo Cap-and-Trade Program, the cost is estimated to be about ¥100 million. * Our emissions in the 2nd period are actually expected to be partially offset by the surplus in the 1st period.	The cumulative costs of upgrading facilities and enhancing operations at the seven NTT Data buildings in Tokyo in Fiscal 2017 and 2018 was approximately ¥700 million.
Risk 3	Data center shutdown due to abnormal weather	Physical risk	Abnormal weather such as large typhoons, floods, heat waves, and torrential rainfalls may increase the risk of data center shutdown due to a power cut, flood, and lightning strike.	Short term	If a data center is shut down for one day, the sales loss will be ¥3.2 billion (average daily sales calculated from total sales). In reality, we would suffer further damage, such as a decline in trust, so this figure is actually the lowest value that could be expected.	The annual cost of upgrading air conditioning for the purpose of preventing cessation of self-generation of power in times of crisis and to reduce power consumption (minimum cost of countermeasures) is approximately ¥1.0 billion.
Risk 4	Increase in operating costs due to rising average temperature	Physical risk	Operating costs may increase due to rising average temperature.	Short term	If the temperature rises by 1℃ , it is estimated that power consumption at data centers in Japan will increase by approximately 5.4 million kWh and energy costs will increase by approximately ¥80 million per year.	The cumulative costs of upgrading facilities and enhancing operations all data centers in Japan between fiscal 2012 and 2018 exceeded 4.9 billion yen.
Risk 5	Outflow of excellent human resources	Transition risk	Employee retention may be reduced if the public reputation of the Company is impaired and employee satisfaction declines due to the Company's ESG performance.	Long term	If the Company's superiority is lost and the turnover rate is at the same level as the industry standard, sales will decrease by ¥62.2 billion.	Our education and training costs to enhance employees'expertise, including their training on global trends in and the Group's response to climate change, are approximately ¥7.8 billion. The annual running cost of telework, etc. for realizing flexible work styles that allow employees to work in their home or satellite offices is approximately ¥1.1 billion. The total costs are, therefore, ¥8.1 billion.
Risk 6	Decline in reputation due to delayed response	Transition risk	Investors'evaluation of the Company may deteriorate, resulting in a decline in its stock prices if the Company fails to respond swiftly to an increasing number of requests from investors to disclose ESG information.	Short term	If the price of shares held by overseas investors falls by 0.1%, the impact on the Company's market capitalization will amount to approximately ¥293 million. *Calculated on the basis of 1,402,500,000 outstanding shares as of March 31, 2019	The cost incurred to respond to investor requests to disclose corporate information regarding climate change is about ¥20 million.
Opportunity 1	Increase in demand for energy-efficient data centers	Opportunity to increase demand for services	Demand for data centers may increase because the enforcement of the Paris Agreement will necessitate the improvement of the efficiency of IT systems, which account for a large proportion of corporate energy consumption.	Medium term	Data centers and their related services are a ¥57.0 billion business (as of March 31, 2019), and we believe that they will grow into a ¥62.0 billion business in 2020 due to demand for outsourcing to energy-efficient data centers.	The total cost of research and development in the reporting year, including Green Data Center element technologies such as AI/IoT, Deep learning and virtualization, was ¥15.1 billion.
Opportunity 2	Increase in demand for cloud services due to increased abnormal weather	Opportunity to increase demand for services	The use of cloud-based data centers, which offer a high level of safety and protection of corporate data from being lost in abnormal weather, may accelerate.	Short term	The NTT DATA Group's cloud computing services sales were ¥584.6 billion in 2018.	The amount of our investments in cloud computing services made between fiscal 2009 and 2016 was more than ¥10.0 billion.
Opportunity 3	Increase in demand for smart meters	Opportunity to increase demand for services	The improvement of the efficiency of social infrastructure may accelerate due to rising concern regarding climate change and increasing energy costs.	Short term	We are receiving orders for smart meter operation management systems and being given opportunities to plan cloud services for electric power companies. For the five years beginning in 2017, we are aiming for cumulative sales of ¥10.0 billion for all electricity retail liberalization services.	The total expenditure on research and development, including the cost of research and development associated with smart cities, such as automatic driving and traffic congestion prediction and amelioration simulations, and smart meter operation and management such as AI/IoT, is ¥15.1 billion.
Opportunity 4	Recruiting excellent human resources	Opportunity to acquire human resources	Adoption of more flexible work styles such as telework may lead to the acquisition of human resources.	Medium term	We are promoting telework throughout the Company to realize flexible work styles and reduce CO_2 emissions from commuting. Effect of flexible work styles such as telework on CO_2 emissions reduction is estimated to be equivalent to about ¥90 million.	Our telework environment operating costs, such as those for participation in Telework Days and development using the Integrated Development Cloud, NTT Data Groupwide development environment, are ¥1.1 billion.

[1]: Short term: current year; Medium term: 1 year to less than 3 years; Long term: 3 to 13 years

Reducing Greenhouse Gas Emissions

To mitigate the risks and realize the opportunities posed by climate change, we need to reduce greenhouse gas emissions from both ourselves and other sources in our supply chain.
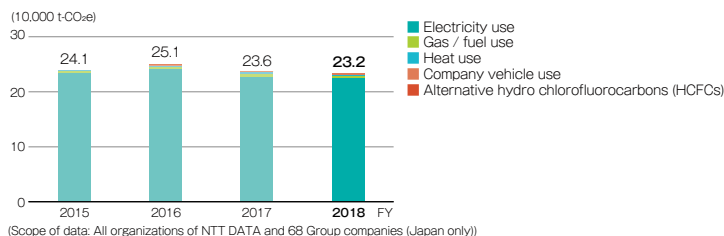
Initiatives of the NTT DATA Group

In fiscal 2018, we continued to actively promote power-saving measures with a particular focus on diversifying work-styles, such as promoting telework.

Data centers account for approximately two-thirds of the greenhouse gas emissions discharged by the NTT DATA Group's business activities. Since our data centers are entrusted with clients' systems, we strive to maximize reductions in power consumption to the extent that such reductions do not affect our services to clients. We are also increasing the use of renewable energy, and out of the 357,957 MWh in total electricity used at all of our data centers, 221 MWh is being generated by solar power and other low-carbon energy sources.

As a result of our efforts to hold the increase in GHG emissions to 5% or less in fiscal 2018 compared to fiscal 2013, we were able to achieve the target by reducing emissions by 5% over fiscal 2013 levels.

▶ Greenhouse Gases

(10,000 t-CO$_2$e)

- Electricity use
- Gas / fuel use
- Heat use
- Company vehicle use
- Alternative hydro chlorofluorocarbons (HCFCs)

2015	2016	2017	**2018** FY
24.1	25.1	23.6	**23.2**

(Scope of data: All organizations of NTT DATA and 68 Group companies (Japan only))
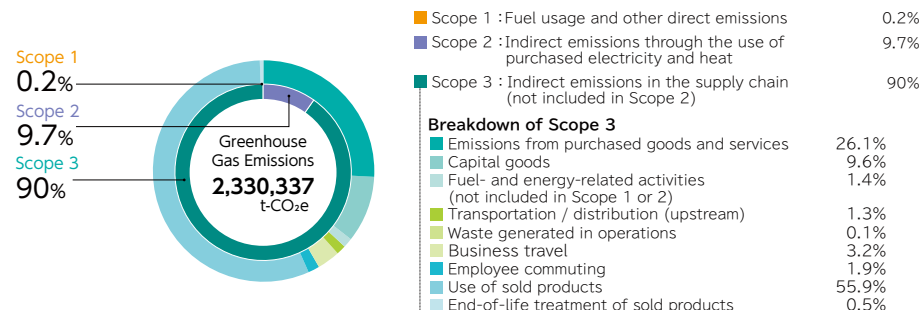
Managing Greenhouse Gas Emissions across the Supply Chain

To reduce the risks of climate change and realize a low-carbon society, it is important to engage in energy-saving measures not only for the Company's facilities but for society as a whole. The NTT DATA Group integrates environmental considerations into all aspects of its corporate activities. To this end, from fiscal 2013 the NTT DATA Group broadened the scope of its aggregate calculation of greenhouse gas emissions and began management under Scope 3, which calculates the aggregate amount of these emissions by taking product and service lifecycles into account, from their procurement through their distribution and to their disposal. As a result, total greenhouse gas emissions of the NTT DATA Group, including overseas Group companies, was 2,330,337 t-CO$_2$e.

Moving forward, the entire NTT DATA Group will build on this result by seeking measures that are even more effective toward the creation of a low-carbon society and will confront challenges in conjunction with its clients and business partners.

▶ Emission Rates by Scope for Fiscal 2018

Scope 1
0.2%

Scope 2
9.7%

Scope 3
90%

Greenhouse Gas Emissions
2,330,337
t-CO$_2$e

■ Scope 1 : Fuel usage and other direct emissions	0.2%
■ Scope 2 : Indirect emissions through the use of purchased electricity and heat	9.7%
■ Scope 3 : Indirect emissions in the supply chain (not included in Scope 2)	90%

Breakdown of Scope 3

■ Emissions from purchased goods and services	26.1%
■ Capital goods	9.6%
■ Fuel- and energy-related activities (not included in Scope 1 or 2)	1.4%
■ Transportation / distribution (upstream)	1.3%
■ Waste generated in operations	0.1%
■ Business travel	3.2%
■ Employee commuting	1.9%
■ Use of sold products	55.9%
■ End-of-life treatment of sold products	0.5%

Third-Party Certification Concerning Greenhouse Gas Emissions

We received third-party verification of our greenhouse gas emissions (Scope 1, 2, and 3), energy consumption, and water consumption in fiscal 2018 from Lloyd's Register Quality Assurance Limited.

Verification of Scope 1 and 2, energy consumption, and water consumption applies to all organizations of NTT DATA and 68 domestic Group companies, while Scope 3 verification applies to consolidated (all organizations of NTT DATA and all 304 Group companies in Japan and overseas).

▶ Summary of Third-Party Assured Data in Fiscal 2018

Indirect GHG emissions (Scope 1)	5,746 t-CO$_2$e
Energy source indirect GHG emissions (Scope 2 market basis)	226,475 t-CO$_2$e
Energy source indirect GHG emissions (Scope 2 location basis)	226,229 t-CO$_2$e
Other indirect GHG emissions (Scope 3)	2,098,117 t-CO$_2$e
Energy consumption	496,708 MWh
Water consumption	618,291 m³

Third-Party Verification

🖥 https://www.nttdata.com/global/en/sustainability/third-party-evaluation

Appropriate Use of Resources

Promoting Resource Saving and Recycling

Waste Reduction

In fiscal 2018, we continued our efforts from the previous fiscal year to improve our recycling ratios and reduce the final amount of waste disposal. As a result, we significantly exceeded our targets by achieving a 94% reduction in the final amount of waste disposal compared to fiscal 2013 and a final waste disposal rate of 0.23%.

Final amount of waste disposal and final waste disposal rate are based on material confirmed as Scope 3 Category 5 "scrap waste from business" through third-party verifications of greenhouse gas emissions.

In fiscal 2019, we will strive to improve our recycling ratios through measures such as using disposal firms with high recycling ratios and changing the processing route while maintaining our efforts on the reuse and recycling of office equipment.

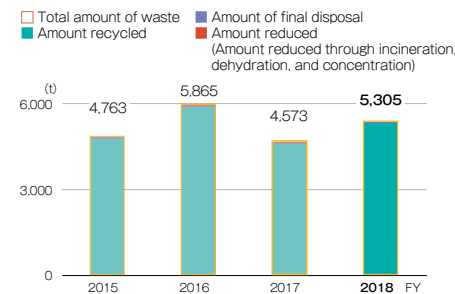### Reduction of Copy Paper Purchased

In fiscal 2018, we once again made a committed effort to reduce the unnecessary use of copy paper through measures such as controlling individual organizations'usage and advancing paperless meetings. As a result, we significantly exceeded our target for fiscal 2018 of reducing usage by 34.1% compared to fiscal 2013.

In fiscal 2019, we will further reduce the use of copy paper as part of an overall revision of our operations, including improvements to our operational processes.

Proper Handling of Hazardous Materials

The NTT DATA Group stores manufactured goods containing PCB. Accordingly, the Group handles such items as waste PCB, which is designated as a specified toxic industrial waste material. Moreover, the Group disposes of materials including waste acid from batteries. In the handling of industrial waste materials requiring special storage and proper management, we carefully observe the Waste Management and Public Cleansing Law and all other relevant laws and regulations particularly with respect to disposal. We have promoted the systemic disposal of waste PCB since fiscal 2013 in line with the Law Concerning Special Measures against PCB Waste and guidance from relevant ministries and government agencies.

▶ Office Waste
(Waste produced by offices and data centers)

☐ Total amount of waste ■ Amount of final disposal
■ Amount recycled ■ Amount reduced
(Amount reduced through incineration, dehydration, and concentration)

(t)
	2015	2016	2017	2018 FY
	4,763	5,865	4,573	5,305

▶ Construction Waste
(Waste produced through construction and demolition of Company buildings)

■ Amount recycled ■ Amount of final disposal

(t)
	2015	2016	2017	2018 FY
	36,512	11	1,118	1,795
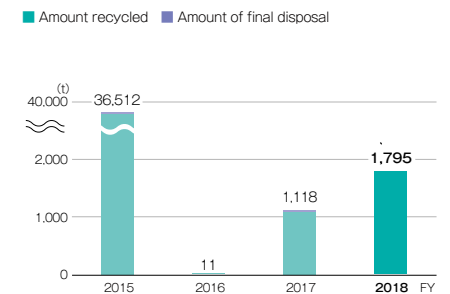
Reducing the Environmental Impact of the Value Chain

The Greening of Clients and Society

Reducing the Environmental Impact of Society through IT

The NTT DATA Group and the NTT Information Network Laboratory Group have jointly verified general-purpose evaluation and measurement methods[1] for quantitatively evaluating the effectiveness of environmental impact reduction for all development projects. We began conducting quantitative evaluation in 2014 with tools based on the results of this verification.

We recommend the Groupwide utilization of these methods, which are more suited to general-purpose applications and actual business conditions than to the environmental impact assessment system[2] used in the past.

[1]: The results of our joint verification have been patented (Pat. No. 5785229 (2015)).
[2]: A service for assessing the environmental impact of information systems developed by the NTT Information Network Laboratory Group. The service calculates environmental impact reductions that can be achieved through reduced consumption of materials and energy, transportation volume of people and goods, etc., resulting from system introduction.

Proactively Participating in Environmental Projects Promoted by Administrative and Industrial Organizations

The NTT DATA Group participates in environmental projects promoted by the government and other organizations, taking advantage of technologies and expertise honed from the construction of numerous public administration systems. We also actively join environmental working and other groups of a variety of organizations.

In recent years, we have been exchanging a wide range of opinions as a member of the Japan Smart Community Alliance (JSCA)[3] and the Green IT Promotion Council[4]. These discussions include the creation of smart communities aimed at realizing next-generation sustainable societies, the development of methods for estimating and measuring the energy-saving of and with IT, and research involving the introduction of energy management systems to buildings and stores.

Also, as a Ministry of the Environment project, we will continue to develop systems for demonstration experiments on ESG information disclosure and dialogue platforms for the purpose of promoting ESG investment ongoing since fiscal 2013 and aim for practical application in 2020. We support the promotion of ESG investment through the development and provision of platforms that realize the disclosure of non-financial information according to financial information formats as well as opportunities for dialogue with investment institutions and companies.

[3]: An organization comprised of members of both the public and private segments that was established to promote the spread of smart communities within Japan as well as their global expansion.
[4]: Sponsored by the Japan Electronics and Information Technology Industries Association (JEITA), the Green IT Promotion Council is responsible for promoting Green IT and helping build a smart society through various activities. These include developing methods for estimating and measuring the energy-saving of and with IT devices, formulating an energy-saving technology roadmap, developing public awareness about Green IT in Japan and overseas, and bolstering cooperation with countries in Asia and elsewhere.

Promoting Green Purchasing

Promoting Green Purchasing through an Assessment of a Company's Corporate Stance and Products

The NTT DATA Group has established an assessment criterion with respect to environmental preservation and protection of products and services as factors in procuring items and selecting business partners. This criterion complements such traditional criteria as price and quality assessment. Collectively, this evaluation criteria sets out specific standards for selecting suppliers. In fiscal 2018, 36 new suppliers were selected based on the environmental standards, accounting for 17% of important suppliers.

Emphasized Assessment Items

At present, assessments conducted with the aim of promoting green purchasing centered on evaluating the approach a company takes with regard to environmental issues. While this naturally includes compliance with environmental laws and regulations, considerable weight is also attached to whether or not ISO 14001 certification and other environmental management standards have been acquired. Furthermore, we assess the operating effectiveness of environmentally oriented management in place at suppliers that have not attained environmental certification. We do this by asking specific questions based on a checklist, such as whether or not they have environmental guidelines, targets for reducing the environmental impact of their activities, or an environmental management structure.

▶ Mechanism of Green Purchasing
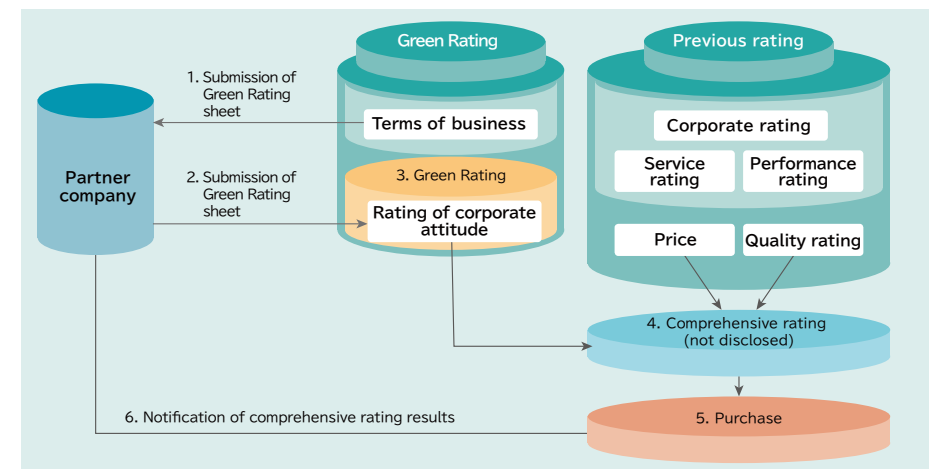
Environmental Data

▶ Fiscal 2018 Environmental Impact Data

Environmental Data			Units	Amount
Paper resources	Paper resources Total volume used (including paper from virgin pulp and recycled paper)		t	689
		Office paper	t	671
		Client services (leaflets, pamphlets, instruction manuals, etc.)	t	18
	Amount of total paper from virgin pulp		t	641
		Office paper	t	624
		Client services (leaflets, pamphlets, instruction manuals, etc.)	t	16
Global warming	Greenhouse gas emissions (CO_2) conversion[1]		t-CO_2e	232,221
	Carbon dioxide (CO_2 emissions)		t-CO_2e	231,603
		Electricity use	t-CO_2e	223,692
		Gas / fuel use	t-CO_2e	3,640
		Heat use	t-CO_2e	2,782
		Company vehicle use	t-CO_2e	1,488
	Methane (CH_4) emissions		t-CO_2e	6
		Furnaces	t-CO_2e	3
		Shipping (automobiles, ships)	t-CO_2e	3
	Dinitrogen monoxide (N_2O) emissions		t-CO_2e	64
		Furnaces	t-CO_2e	1
		Shipping (automobiles, ships)	t-CO_2e	63
	Hydrofluorocarbon (HFC) emissions[2]		t-CO_2e	537
	Perfluorocarbon (PFC) emissions		t-CO_2e	0
	Sulfur hexafluoride (SF_6) emissions		t-CO_2e	11
	Low-pollution vehicles owned Vehicles		Vehicles	776
		Hybrid vehicles	Vehicles	164
		Certified fuel-saving or low-emission vehicles (gasoline-powered vehicles)	Vehicles	579
		Electric vehicles	Vehicles	4
		Others	Vehicles	29
	Low-pollution vehicles introduced during the period		Vehicles	39
		Hybrid vehicles	Vehicles	39
		Certified fuel-saving or low-emission vehicles (gasoline-powered vehicles)	Vehicles	0
		Electric vehicle	Vehicles	0
		Others	Vehicles	0
	Sustainable / new energy systems installed		Units	3
		Solar power systems	Units	3
		Hybrid (solar and wind power) systems	Units	0
		Cogeneration systems (CGS)	Units	0
	Sustainable / new energy systems introduced during the period		Units	0
		Solar power systems	Units	0
		Hybrid (solar and wind power) systems	Units	0
		Cogeneration systems (CGS)	Units	0
	Electric power generated by sustainable / new energy systems		kWh	220,543
		Solar power systems	kWh	220,543
	Electric power generated by sustainable / new energy systems introduced during the period		kWh	0
		Solar power systems	kWh	0

Environmental Data			Units	Amount
Waste countermeasures	Industrial waste requiring special management, etc.			
		Asbestos removed (from buildings) during the period	Instances	1
		Asbestos emissions (from buildings) during the period	t	3
		Waste batteries	t	0
		Other waste (acidic ash, alkali, oil, etc.)	t	0
	Use of products containing PCBs		Units	1
		Transformers	Units	1
	PCB-containing products renewed (removed, stored) during the period		Units	0
		Transformers	Units	0
		Stabilizers	Units	0
	Storage of PCB-containing products		Units	0
		Transformers	Units	0
		Stabilizers	Units	0
	Disposal of PCB-containing products during the period		Units	0
		Transformers	Units	0
		High-voltage condenser	Units	0
		Low-voltage condenser	Units	0
		Stabilizers	Units	0
Ozone layer protection	Removal of air-conditioning system units using chlorofluorocarbons (CFCs) during the period			
		Removal of air-conditioning system units using specified CFCs	Units	2
		Removal of air-conditioning system units using alternative hydrochlorofluorocarbons (HCFCs)	Units	18
		Removal of air-conditioning system units using alternative hydrofluorocarbons (HFCs)	Units	18
		Recovery and destruction of specified CFCs used for air-conditioning systems	kg	1
		Recovery and destruction of alternative HCFCs used for air-conditioning systems	kg	138
		Recovery and destruction of alternative HFCs used for air-conditioning systems	kg	287
	Use of air-conditioning system units using CFCs			
		Air-conditioning system units using specified CFCs	Units	8
		Air-conditioning system units using alternative HCFCs	Units	221
		Air-conditioning system units using alternative HFCs	Units	1,698
		Specified CFCs used for air-conditioning systems	kg	8,861
		Alternative HCFCs used for air-conditioning systems	kg	5,396
		Alternative HFCs used for air-conditioning systems	kg	53,886
	Storage of air-conditioning system units using CFCs			
		Storage of air-conditioning system units using specified CFCs	Units	0
		Storage of air-conditioning system units using alternative HCFCs	Units	4
		Storage of air-conditioning system units using alternative HFCs	Units	0
		Stored amount of specified CFCs used for air-conditioning systems	kg	0
		Stored amount of alternative HCFCs used for air-conditioning systems	kg	49
		Stored amount of alternative HFCs used for air-conditioning systems	kg	0

Environmental Data		Units	Amount
Ozone layer protection	Use of vehicles using CFCs		
	Number of Company vehicles that employ CFCs in air-conditioner refrigerants	Vehicles	0
	Number of Company vehicles that employ HCFCs in air-conditioner refrigerants	Vehicles	0
	Number of Company vehicles that employ HFCs in air-conditioner refrigerants	Vehicles	778
	Use of CFCs in vehicle air-conditioners	kg	0
	Use of HCFCs in vehicle air-conditioners	kg	0
	Use of HFCs in vehicle air-conditioners	kg	1,823
	Elimination of specified-CFC fire prevention equipment		
	Buildings from which specified-CFC fire prevention equipment removed during the period	Buildings	0
	Amount of specified CFCs removed from fire prevention equipment during the period	kg	0
	Amount of specified CFC gas emitted by fire prevention equipment during the period	kg	0
	Remaining number of buildings employing specified-CFC fire prevention equipment	Buildings	10
	Remaining specified CFC gas emissions from fire prevention equipment	kg	28,706
Resource usage	Consumption of water resources	㎥	912,329
	Clean water consumption	㎥	451,097
	Sewerage water consumption	㎥	294,038
	Gray water consumption	㎥	6,441
	Rainwater consumption	㎥	0
	Consumption of clean, sewerage, and other water (Total water consumption)	㎥	160,753

(Scope of Environmental Impact Measurement: All NTT DATA organizations, 68 Group companies in Japan)
*1: CO_2 conversion factor uses CO_2 emission factor by electric power companies.
*2: Units and emissions from fiscal 2013 include individual free-standing air-conditioning units as well as central air-conditioning units.

▶ Fiscal 2018 Recycling Amounts

Primary Category	Subcategory	Recycled Amount
Company computers	Recycled amount (Number of units)	6,927
	Reused amount (Number of units)	13,202
Thermal recycling	Recycled non-industrial waste (kg)	450,228
	Recycled industrial waste (kg)	486,636
	Recycling of industrial waste requiring special treatment (kg)	0

(Scope of Aggregate Data: All NTT DATA organizations, 68 Group companies in Japan)

▶ Fiscal 2018 Global Environmental Impact Data and Data Coverage

		Units	Fiscal 2015	Fiscal 2016	Fiscal 2017	Fiscal 2018
Scope 1	Emissions	t-CO₂e	6,073	10,547	8,802	5,746
	Coverage rate of data (sales)	%	76	70	62	64
Scope 2	Emissions	t-CO₂e	238,679	248,591	309,063	275,622
	Coverage rate of data (sales)	%	76	72	67	82
Energy	Total consumption of non-renewable energy	MWh	476,607	504,867	666,261	588,179
	Total amount of renewable energy either purchased or used by the Company (biomass, photovoltaic, wind power, etc.)	MWh	185	248	103,342	102,651
	Total cost of energy consumption	¥1.0 billion	7	8	9	9
	Coverage rate of data (sales)	%	69	72	67	84
Water	Total water usage	million ㎥	0.34	0.55	0.58	0.80
	Coverage rate of data (sales)	%	69	66	57	67
Waste	Total final disposal of waste	t	13	24	24	82
	Coverage rate of data (sales)	%	69	66	57	67

(Scope of data aggregation: Consolidated NTT Data Group companies)

▶ Office Waste in Fiscal 2018

Primary Category	Subcategory	Emissions (kg)	Recycled Amount (kg)	Waste Disposal Amount (kg) Incineration	Landfill Amount	Unknown	Final Disposal (kg)	Recycling Rate (%)	Final Disposal Rate (%)
Recyclable waste, etc.* * "Recyclable waste" represents waste material that can be completely recycled.	Plain copying paper (photocopying and OA paper, etc.)	1,201,837	1,201,837	0	0	0	0	100	0
	Newspaper, magazines, cardboard, miscellaneous recyclable paper	48,536	48,536	0	0	0	0	100	0
	Glass (bottles, etc.)	1,612	1,612	0	0	0	0	100	0
	Scrap metal (cans, etc.)	8,584	8,584	0	0	0	0	100	0
	Plastic (PET) bottles, etc.	7,318	7,318	0	0	0	0	100	0
	Subtotal 1	1,267,888	1,267,888	0	0	0	0	100	0
Non-industrial waste	Plastics	6,445	6,282	0	163	0	163	97	3
	Combustible waste	636,794	620,333	16,461	0	0	1,646	97	0
	Incombustible waste	31,584	28,966	0	2,618	0	2,618	92	8
	Unsorted waste	8,323	0	8,323	0	0	832	0	10
	Subtotal 2	683,146	655,582	24,784	2,781	0	5,259	96	1
Industrial waste	From offices — Waste plastics	337,000	335,312	1,440	248	0	392	99	0
	From offices — Scrap metal	582,878	581,971	66	841	0	848	100	0
	From offices — Refuse glass, waste ceramics	471	471	0	0	0	0	100	0
	From offices — Discarded electric machinery and appliances	586,670	586,612	10	48	0	49	100	0
	From offices — Waste batteries	700	700	0	0	0	0	100	0
	From offices — Product waste containing mercury	677	677	0	0	0	0	100	0
	From offices — Stable mixed waste	256,878	256,678	200	0	0	20	100	0
	From offices — Other	38,220	36,890	1,330	0	0	133	97	0
	Subtotal 3	1,803,495	1,799,312	3,046	1,137	0	1,442	100	0
	Produced through operations — Waste plastic	410,148	405,267	1,089	3,792	0	3,901	99	1
	Produced through operations — Scrap metal	362,668	362,305	0	363	0	363	100	0
	Produced through operations — Refuse glass, ceramic waste	83,871	83,771	0	100	0	100	100	0
	Produced through operations — Wastepaper (only includes paper from the printing business)	1,549	1,549	0	0	0	0	100	0
	Produced through operations — Waste wood (only includes wood from the warehouse and distribution businesses)	152,440	152,420	20	0	0	2	100	0
	Produced through operations — Discarded electric machinery and appliances	254,841	249,313	0	5,528	0	5,528	98	2
	Produced through operations — Medical measuring equipment	0	0	0	0	0	0	0	0
	Produced through operations — Waste batteries	980	980	0	0	0	0	100	0
	Produced through operations — Product waste containing mercury	3,588	3,588	0	0	0	0	100	0
	Produced through operations — Stable mixed waste	99,312	99,312	0	0	0	0	100	0
	Produced through operations — Controlled mixed waste	179,153	179,153	0	0	0	0	100	0
	Produced through operations — Waste oil	390	0	390	0	0	39	0	10
	Produced through operations — Waste acid	0	0	0	0	0	0	0	0
	Produced through operations — Waste alkali	1,060	1,060	0	0	0	0	100	0
	Produced through operations — Sludge	0	0	0	0	0	0	0	0
	Produced through operations — Waste containing asbestos	0	0	0	0	0	0	0	0
	Produced through operations — Other	0	0	0	0	0	0	0	0
	Subtotal 4	1,550,001	1,538,720	1,499	9,782	0	9,932	99	1
Industrial waste requiring special treatment	Flammable waste oil	10	0	10	0	0	1	0	10
	Waste acid with a Ph of 2.0 or less	70	69	0	1	0	1	99	1
	Waste alkali with a Ph of 12.5 or higher	0	0	0	0	0	0	0	0
	Infectious waste	0	0	0	0	0	0	0	0
	Specified hazardous industrial waste (Discarded mercury)	0	0	0	0	0	0	0	0
	Specified hazardous industrial waste (Other)	0	0	0	0	0	0	0	0
	Subtotal 5	80	69	10	1	0	2	86	3
Grand total (Subtotals 1–5 combined)		5,304,610	5,261,570	29,339	13,701	0	16,635	99	1

(Scope of Aggregate Data: All NTT DATA organizations, 68 Group companies in Japan)

Governance

We engage in sound and transparent corporate management in a bid to secure sustainable growth while endeavoring to earn the trust of stakeholders.

NTT DATA Group's Approach

While practicing sound and transparent management, the NTT DATA Group contributes to the ongoing growth and development of clients and society by creating new paradigms and values.

We also work toward promoting a prosperous, well-balanced, safe and secure society as we endeavor to grow in our own right. We strongly believe that these aspirations and endeavors encapsulate our mission and responsibilities as a company.

With this understanding, we have constructed an effective system of corporate governance and adhere strictly to all statutory and regulatory requirements while ensuring that frontline employees carry out their duties in an ethical manner. In conjunction with efforts aimed at ensuring our approach toward management takes root across the entire Group, we place the utmost emphasis on management efficiency and discipline. Through these means, we continue to build a robust foundation for ESG management that responds to the expectations of the global community.

Employees received Information Security training in FY2018
100%

Female Directors and Audit & Supervisory Board Members in FY2018
11.76%

Employees received Compliance training in FY2018
98.3%

Contents

Corporate Governance

Policies

NTT DATA is working on the following basic policies in accordance with the purpose of each principle of Japan's Corporate Governance Code to ensure that corporate governance will effectively function: (1) to ensure transparency and soundness in business management; (2) to achieve appropriate and swift decision-making and business execution; and (3) to implement compliance thoroughly.

(1) Ensuring Transparency and Soundness in Business Management

NTT DATA strives to disclose information in a just, fair, and timely manner in accordance with the Disclosure Policy, based on the Disclosure Guidelines. Information disclosure is important in that it enables the market to appraise NTT DATA appropriately. For this reason, NTT DATA holds financial results briefing quarterly, and often holds other meetings for domestic and international investors and analysts in order to ensure transparency in business management. To reinforce the function of supervising and auditing the fairness in business execution, NTT DATA places Outside Directors and Outside Audit & Supervisory Board Members to supervise and conducts audits in Board of Directors and the Audit & Supervisory Board and to ensure soundness in its business management. NTT DATA also pays attention to maximize the profit of its shareholders when transacting business with NTT, the holding company of NTT DATA, and the companies in the NTT Group. With regards to transactions involving conflicts of interest as defined in the Companies Act, such as direct transactions between the Company and an individual director of the Company and transactions between the Company and another organization/company represented by a director of the Company, the Company's Regulations of the Board of Directors stipulate that approval must be obtained from the Board of Directors in advance. Such approval is given only after the legal department reviews and confirms the validity and economic rationality of the transaction, such as whether the terms and conditions are equivalent to those of general transactions. Even after approval is granted, the status and other information of the transaction are regularly reported to the Board of Directors.

(2) Achievement of Appropriate and Swift Decision-Making and Business Execution

Decision-making at NTT DATA is carried out under the supervision of the Board of Directors in accordance with Authority Rules, which stipulate the responsibility and authority of the president and CEO, the senior executive vice president, the officers in charge of each segment and region, and the heads of each section or group. For smooth and swift decision-making and supervision in its business operations, NTT DATA has established the Corporate Management Committee, which is made up of the president and CEO, the senior executive vice president, officers in charge of each segment and region, and other heads of important sections or groups.

The Corporate Management Committee holds preliminary discussions about the items to be resolved at the Board of Directors' meetings in order to enrich discussions held at that level. In addition, NTT DATA pursues appropriate and swift decision-making and business execution by placing senior vice presidents in charge of business execution, assigning most of the authority relating to business execution to such senior vice presidents from directors, with each section or group executing business operations independently and responsibly in accordance with the Organizational Regulations.

(3) Thorough Implementation of Compliance

NTT DATA is determined to operate its business in accordance with high ethical standards as well as compliance by establishing its Global Compliance Policy, targeted at all officers and employees of the NTT DATA Group, in order to clarify its basic policy and specific behavior guidelines relating to corporate ethics. To ensure the effective implementation of the Global Compliance Policy, NTT DATA conducts various educational activities on compliance for its employees continuously, such as training and attitude surveys. Furthermore, in pursuit of a more open corporate culture, NTT DATA operates hotlines, "Harassment Hotline" and "Whistle Line", which function as Groupwide points of contact to receive both anonymous and named reports from within and outside of the Company. NTT DATA ensures that reporters to the lines will not be unfavorably treated because of their reporting.

Structure

Governance Structure designed to Improve Management Quality by Enhancing the Functions of Execution, Supervision and Audit

As a company with corporate auditors, NTT DATA has a Board of Directors and an Audit & Supervisory Board, as well as a Corporate Management Committee.

The Board of Directors meets, in principle, monthly, holds extraordinary meetings as necessary, and is responsible for decision-making and supervision regarding legal and important management matters. In addition to introducing both business segments and department systems, we have also appointed regular executive officers, whose responsibility is to focus on business execution. By having directors delegate significant executive authority to executive officers, NTT DATA aims to accelerate the decision-making process. The Audit & Supervisory Board meets, in principle, once a month to decide on audit policies, plans, methods, and various other important audit-related matters. The Corporate Management Committee is an advisory body operating under the authority of the president and CEO. The president and CEO and persons appointed by the president and CEO meet in principle, once a week to discuss business

policies and important management matters to establish and ensure smooth execution of basic management strategies.

Regarding self-assessments and analyses in fiscal 2018, the following methods were conducted on the advice of an external organization.

• Implementation period: October 2018

• Assessment method: A survey was implemented targeting all directors who are members ofthe Board of Directors and Audit & Supervisory Board members (Five-point scale questions. A comment field is also provided for each question category, where respondents can freely express their views.)

• Response method: Responses were provided to an external organization to ensure anonymity

The results of the survey, aggregated and reported by the external organization, were analyzed, discussed, and evaluated between December 2018 and February 2019. The evaluation results were then reported to the Board of Directors, where discussions were held regarding the results and to explore policies for further improvement. From this survey, it was found that the composition and operation of the Board of Directors were generally evaluated positively, reaffirming our understanding that the effectiveness of the Board of Directors is maintained overall.

With regards to the need to further deepen and intensify discussions on management strategies as well as to further improve the content of reports for investors, which are issues brought to light by the fiscal 2017 survey, evaluation scores went up, indicating that a certain level of improvement had been realized.

While it showed the overall improvements made over the fiscal 2017, the survey, as aforementioned revealed issues that remains to be addressed. Thus we are working to better design the operation of the Board of directors by addressing the those issues including the following:

• Further deepening and intensifying of discussions on management strategies (ongoing issue)

• Increase of information and opportunities to further expand our knowledge on the latest trends in technology and the Company's businesses

• Further increase of opportunities to communicate with outside directors and Audit & Supervisory Board Members

Moving forward, we will continue to evaluate the effectiveness of our Board of Directors and proceed with initiatives aimed at raising its functionality.

▶ Corporate Governance Structure
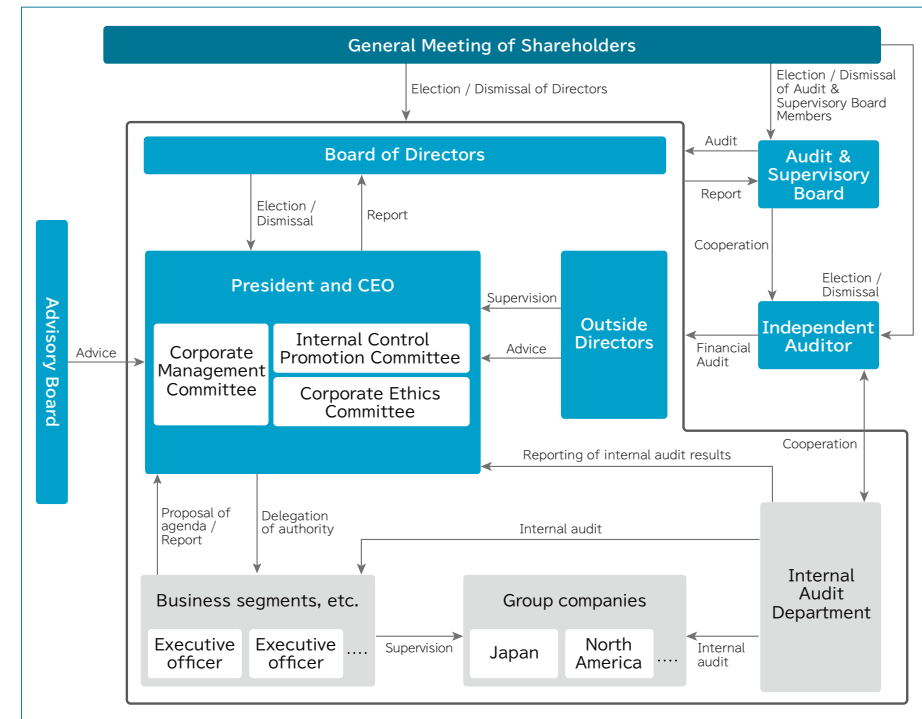
Efforts to incorporate diverse perspectives into management

NTT DATA continues to strengthen functions that oversee fairness in business execution by inviting directors and Audit & Supervisory Board members from outside the Company. As of July 2019, NTT DATA had three outside directors and four outside Audit & Supervisory Board members. In appointing outside officers, the Company provides selection criteria that anticipate that they will bring to management opinions from broad perspectives that draw on their respective experiences. NTT DATA has three outside directors and two outside auditors registered as independent directors/auditors who meet the requirements of Tokyo Stock Exchange regulations as well as its own in-house requirements. In addition, we established an Advisory Board in July 2012 that has since obtained advice from outside experts to expand our scope of management, achieve further growth, and ensure the sound management of our operations.

Group Governance

Strengthening Group Governance by Establishing a Liaison Department responsible for collaborating with a Group Company

For important matters such as business planning, internal control, and compliance, NTT DATA's basic policy is to ensure appropriate business operations throughout the Group by instituting rules for consultation and reporting within each Group company. Based on this policy, the Company has established a cooperative system through the establishment of a liaison department in NTT DATA that connects to each Group company.

In particular, Group governance has been reinforced in response to the rapid expansion of overseas operations through M&A activities and other measures. Specifically, the Company is establishing a system centered around five operating regions — North America, EMEA (Europe, the Middle East, and Africa), APAC (Asia–Pacific), China, and Spain / Latin America — as well as business solutions. NTT DATA has instituted rules for consultation and reporting between the Company and Group companies in relation to such important matters as business plans, large-scale projects, internal control, and compliance.

Furthermore, NTT DATA is building a governance system that enables the unified management of the Group while delegating responsibility for business management to each regional head office.

As part of this initiative, NTT DATA has established nomination and compensation committees and audit committees within the boards of directors in regional head office. Meanwhile, the Group has a structure that facilitates the appropriate and timely sharing of information about risks and other important matters of concern by a comprehensive internal control system that includes overseas organizations.
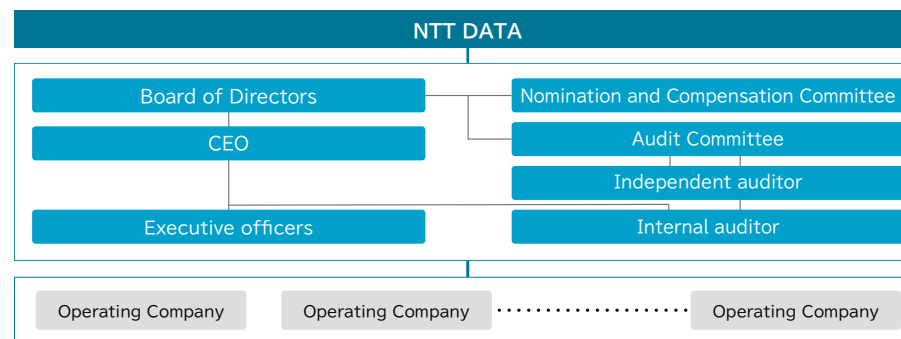
In Japan, in fiscal 2014 NTT DATA increased management efficiency by operating the common accounting system that domestic Group companies use. As of March 31, 2019, NTT DATA extended the introduction of this system, which is used by approximately 70 major domestic Group companies. As a result, many domestic Group companies use a common accounting system. This enables centralized management of accounting information and the securing of internal control. Furthermore, the use of this system significantly reduces maintenance and operational burdens.

Moreover, aiming to increase the efficiency of Group management, NTT DATA introduced an inhouse Group Management Infrastructure system that visualizes domestic Group companies' management information (in the financial and personnel fields). Through this new system NTT DATA aims to optimize management resource allocation to reflect project characteristics, expedite business management, enhance the precision of information used for decision-making, and realize Group synergies.

Ensuring Robust Group Governance Based on Group Management Policies and Group Management Rules

To optimize the Group as a whole, the NTT DATA Group established Group Management Policies to define the basic approach to Group management. In addition, NTT DATA has established rules concerning consultation and reporting between Group companies. We have combined these rules with the aforementioned Group Management Policies and are working to secure sound operation of Group Governance.

▶ Governance Structure of Regional Head Offices

NTT DATA

Board of Directors	Nomination and Compensation Committee
CEO	Audit Committee
	Independent auditor
Executive officers	Internal auditor

| Operating Company | Operating Company | .... | Operating Company |

Initiatives to Spread Our Vision

At the NTT DATA Group, we are working to spread the Values we hold to be important and achieve the Group Vision we have for ourselves ten years from now.

To act with these Values in mind, we must have an idea of how to apply them in our work duties. For this reason, we are given an opportunity to engage in dialogue with our co-workers.

Since 2014, we call the week of the May 23, the date of our founding, "Values Week." "Values Week" is also a series of events to discuss the Values among the NTT DATA colleagues. During "Values Week 2018," approximately 20,000 employees in 100 cities and nearly 30 countries took part in workshops and discussed the Values ardently.

China

Vietnam

The United Kingdom

Internal Control

Maintaining and Continuously Strengthening Internal Control Systems

The NTT DATA Group promotes the creation and maintenance of internal control systems based on a basic policy of always considering risks arising from business activities and taking various types of measures to realize efficient implementation of equitable, transparent business activities.

Twice a year, we convene meetings of the Internal Control Promotion Committee, which is tasked with assessing the effectiveness of internal control systems and managing and furthering overall internal control. With its global business expanding, the Company will maintain efforts to strengthen the Group's overall internal control capabilities.

Implementation Status of Internal Audits

NTT DATA's Internal Audit Department conducts audits from a standpoint that is independent from operational divisions. In fiscal 2018, the department audited in-house organizations and 27 Group companies primarily focusing on the themes of business process compliance, working hours, appropriateness of outsourcing contract, and information security. The department also monitored the internal auditing activities of 27 Group companies. In addition, as part of Groupwide efforts to enhance internal auditing, 77 domestic and overseas Group companies conducted voluntary inspections based on unified audit items.

Furthermore, as an IT adaption, we have also introduced a monitoring indicator system to detect sings of fraud, and we are expanding the functions of the system using its computer-assisted audit techniques (CAAT) tools to analyze data extracted from various in-house information systems. This system is already adopted into some of our internal organizations and Group companies, and we are considering the possibility of expanding its implementation.

Going forward, NTT DATA will continue to aim to realize coordination with the internal audit divisions of domestic and overseas Group companies and to advance measures to establish a global internal auditing system while increasing the quality and quantity of internal audits.

Education and Training Related to Internal Control Systems

NTT DATA provides an annual e-learning course on internal control to instill its policies and view on internal controls in its group employees.

Directors and Audit & Supervisory Board Member

As of June 20, 2019
15 men and 2 woman (Female ratio of 11.76%)
Board of Directors (Average attendance rate of 98.0% in fiscal 2018)

Position	Name	Outside / Independent	Term	Areas of Responsibility	Concurrent Position	Meeting Attendance	Shares Owned[6]
President and Chief Executive Officer, Representative Director,	Yo Honma	—	*1			18/18	36,200
Senior Executive Vice President and Representative Director	Keiichiro Yanagi	—	*1	Head of HR Headquarters, Responsible for Corporate Strategy** Human Resource, Management, Finance (CFO), Investor Relations, Risk Management (CRO), and Public Relations		18/18	31,400
Senior Executive Vice President and Representative Director	Shigeki Yamaguchi	—	*1	Responsible for Public & Social Infrastructure Segment, Enterprise & Solutions Segment, and China & APAC Segment		18/18	14,700
Senior Executive Vice President and Representative Director	Toshi Fujiwara	—	*1	Responsible for Americas & Europe Segment, and Global Marketing		18/18	17,100
Executive Vice President and Director	Tsuyoshi Kitani	—	*1	Head of Technology and Innovation General Headquarters, Responsible for Technology Strategy (CTO) and Information Security (CISO)*5		18/18	25,700
Executive Vice President and Director	Shunichi Takeuchi	—	*1	Deputy responsible for Public & Social Infrastructure Segment		14/14	10,200
Executive Vice President and Director	Koji Ito	—	*1	Head of North American Sector and EMEA & LATAM Sector, Deputy responsible for Americas & Europe Segment		14/14	7,400
Executive Vice President and Director	Hisashi Matsunaga	—	*1	Head of Third Financial Sector, Responsible for Financial Segment,		—	13,600
Director	Yukio Okamoto	Outside Director, Independent Director	*1		Representative Director of Okamoto Associates, Inc. (to present)	18/18	7,100
Director	Eiji Hirano	Outside Director, Independent Director	*1		Vice Chairman and Director of MetLife, Insurance K.K. (to present), Director of RIKEN CORPORATION (to present)	18/18	4,100
Director	Takashi Ebihara		*1			18/18	1,400
Director	John McCain		*1			10/14	0
Director	Mariko Fujii	Outside Director, Independent Director	*1			—	0
Standing Audit & Supervisory Board Member	Tetsuro Yamaguchi	Outside Audit & Supervisory Board Member	*3			18/18	6,200
Standing Audit & Supervisory Board Member	Tetsuya Obata	Outside Audit & Supervisory Board Member	*2			14/14	1,500
Standing Audit & Supervisory Board Member	Katsura Sakurada	Outside Audit & Supervisory Board Member, Independent Auditor	*2			14/14	1,200
Audit & Supervisory Board Member	Rieko Sato	Outside Audit & Supervisory Board Member, Independent Auditor	*3		Partner of Ishii Law Office (to present), Audit and Supervisory Board Member of Gigno System Japan, Inc. (to present), Director (Audit and Supervisory Committee Member) of Dai-ichi Life Holdings, Inc. (to present) Director of J. FRONT RETAILING, Co., Ltd. (to present)	17/18	8,600

*1: Director's term ends with the closing of the Ordinary General Meeting of Shareholders for the last fiscal year that ends within two years from appointment at the Ordinary General Meeting of Shareholders held on June 20, 2018

*2: Director's term ends with the closing of the Ordinary General Meeting of Shareholders for the last fiscal year that ends within one year from appointment at the Ordinary General Meeting of Shareholders held on June 19, 2018

*3: Audit & Supervisory Board Member's term ends with the closing of the Ordinary General Meeting of Shareholders for the last fiscal year that ends within four years from appointment at the Ordinary General Meeting of Shareholders held on June 22, 2016

*4: Allocation that collectivizes the strategy formulation and implementation related to the Group's technology development and R&D, as well as the formulation and implementation of security strategies

*5: The President and CEO, as well as all other members of the Board of Directors, must own stock in the Company equivalent in value to at least 10% of his or her annual basic remuneration

*6: Full-time directors residing in Japan are required to hold the Company's stock equivalent in value to a certain portion of their annual basic remuneration.

▶ Total Remuneration of Directors and Audit & Supervisory Board Members (Fiscal 2018)

Executive Classification	Number of Persons	Basic Remuneration	Directors' Bonuses	Remuneration Amount
Directors (excluding outside directors)	12 members	¥281 million	¥81 million	¥363 million
Audit & Supervisory Board members (excluding outside Audit & Supervisory Board members)	—	—	—	—
Total	12 members	¥281 million	¥81 million	¥363 million

* The above includes four director who retired as of the conclusion of the 30th Ordinary General Meeting of Shareholders held on June 19, 2018.

* Regarding the remuneration for directors and Audit & Supervisory Board members, by resolution at the 18th Ordinary General Meeting of Shareholders held on June 22, 2006, the amount of remuneration for directors shall be ¥580 million or less and remuneration for Audit & Supervisory Board members shall be ¥150 million or less, annually.

▶ Total Remuneration of Outside Corporate Officers (Fiscal 2018)

	Number of Persons	Basic Remuneration
Total remuneration of outside corporate officers	8 members	¥126 million

Policy Determining Director Remuneration

NTT DATA explains its policy, structure, and levels of remuneration for its directors to the parent company and independent outside directors. The amounts of remuneration are determined, upon receiving appropriate advice from the parent company and independent outside directors, at the Board of Directors' meeting to such extent as resolved at a shareholders' meeting.

· The remuneration for directors (excluding outside directors) is composed of monthly remuneration and bonuses. The amount of monthly remuneration is determined and provided in accordance with the role and scope of responsibility of each director's position. Bonuses are paid in consideration of such factor as the achievement level of the Company's performance indicators, operating income, of the current fiscal year. To reflect medium- to long-term business performance in directors' remuneration, full-time directors residing in Japan are required to spend a certain portion of their monthly remuneration and bonuses for purchasing the Company's shares through the officers' shareholding association and retain all the shares purchased during their term of office. In the case of standard business performance, the ratio of fixed compensation to performance-based compensation is roughly 7:3. Directors residing overseas receive performance-based deferred compensation at overseas consolidated subsidiaries. Moving forward, with the aim of making directors even more conscious about achieving the medium-term management strategy, sustainable growth, and medium- to long-term improvement in corporate value, we will consider increasing the proportion of performance-based compensation, such as stock awards, to the total compensation.

· Outside directors are paid only monthly remuneration, unrelated to business performance in order to ensure a high degree of independence.

· Audit & Supervisory Board member remuneration is determined through consultation with Audit & Supervisory Board members, who are paid only monthly remuneration, unrelated to business performance in order to ensure a high degree of independence.

Compliance

We share our guidelines on ethical conduct beyond legal compliance across the entire Group.

Policy and Structure

NTT DATA positions the Global Compliance Policy, which serves as the foundation of its approach to corporate ethics, as a part of Our Way, and is striving to establish the policy throughout the Group.

Reinforcing the Compliance Promotion System

The NTT DATA Group is diligently spreading its Global Compliance Policy to all related parties, including executives and employees. Within the Company, we are fostering a culture of compliance with legal regulations and ethical rules as well as promoting the establishment of related internal structures and mechanisms.

Each year, our Corporate Ethics Committee, with our Chief Risk Officer (CRO) as chairperson, discusses and reports on details of compliance-related initiatives.

Implementation of Compliance Assessments

The NTT DATA Group conducts compliance assessments of all employees in order to verify the engagement status of its compliance systems and raise awareness.

Under these compliance assessments, employees are asked to answer 30 questions regarding such matters as improper accounting, bribery, and overtime work, and the results are analyzed statistically. By comparing yearly changes, we can prioritize topics with many suggestions in the next year's compliance training sessions. Accordingly, we ensure more thorough corporate ethical awareness and reinforce legal compliance.

Maintaining "the Whistle Line" for the Early Detection of Problems

To maintain sound management through the early detection and correction of behavior that contravenes laws and corporate ethics, the NTT Data Group operates hotlines "a Harassment Hotline" and a "Whistle Line" to receive reports from and provide consultation to all NTT DATA Group personnel, including employees and temporary staff, as well as suppliers.

In operating this system, we place the utmost importance on the protection of privacy, prohibitions against unfair treatment of whistleblowers, and the obligation to uphold confidentiality. We offer consultations and take inquiries regarding human rights issues in general at all times at a contact desk in the Human Rights Promotion Office of the ESG Promotion Department. Investigation results and corrective actions taken are reported to the senior

management and Audit & Supervisory Board Members and utilized to increase the soundness of our business management. We also disclose the number of reports received, changes over time, and other information to Group companies and, as necessary, conduct trend analysis of similar compliance cases. Most noteworthy cases identified through this analysis are shared across the Group to raise attention and prevent their recurrence.

In fiscal 2018, we received 108 reports. In an effort to detect problems early and promote the use of the whistleblowing system, we improved our way of disseminating the system and introduced examples of whistleblowing cases. We are also working to ensure early detection of issues by innovating the ways in which we provide guidance for our internal reporting systems and by introducing examples of previous reports made through them.

When the NTT DATA Group receives information internally, it works to protect the privacy and guarantee the status of the information provider, conduct an impartial investigation, and treat the matter fairly. The information provider will not receive disadvantageous treatment from the Company (from either a personnel or compensation perspective) on the grounds of having provided information. In addition, we have established rules ensuring that employees who are the subject of the information received will not be subjected to disadvantageous treatment from the Company solely on the grounds of having had information provided to the internal reporting desk.

If a violation of compliance or our regulations, such as the Global Compliance Policy and NTT DATA Group Security Policy (GSP), is found as a result of investigation, we will take action based on the disciplinary and other applicable rules established by each Group company.

Such violation may result in disciplinary action, such as pay cuts and/or suspension of work, and, depending on the case, may be reflected in personal evaluation and transfer of violating employees. In fiscal 2018, two disciplinary actions were taken.

Moving forward, we will continue to encourage the use of internal reporting systems and strengthen response initiatives to help prevent the recurrence of reported incidents.

▶ Compliance Consultations over the Last Three Years

(Number of Consultations)

Topic	Fiscal 2016	Fiscal 2017	Fiscal 2018
Number of compliance consultations	85	88	108
Number of compliance-related violations	79	59	83
Misuse of Company expenses	5	8	5
Harassment	56	39	62
Other compliance-related violations	18	12	16
No violations	6	29	25

▶ Flow Diagram of the Whistleblowing System
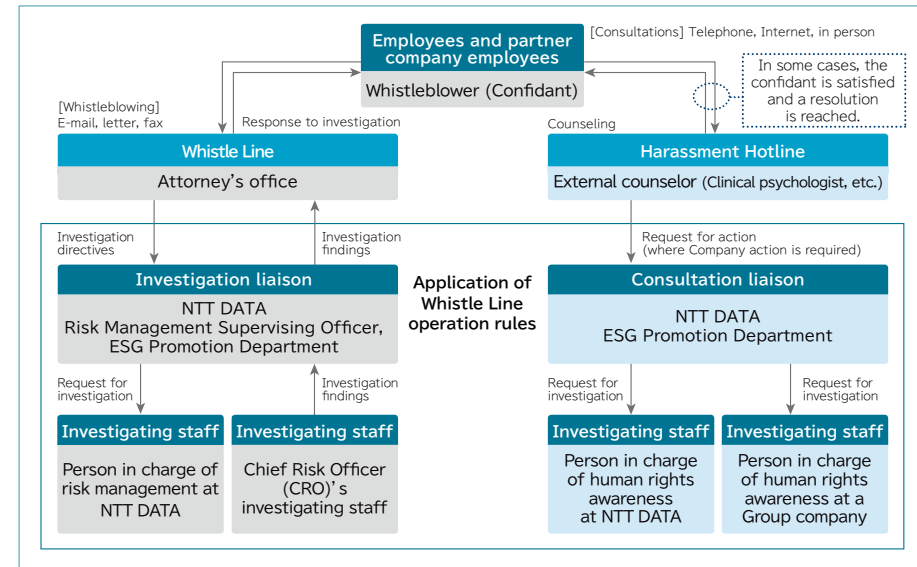
▶ The Whistle Line
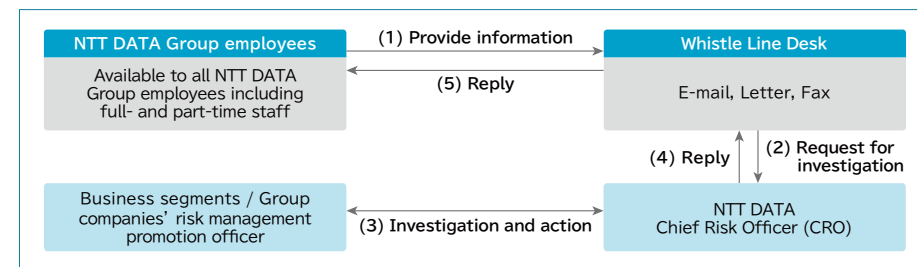
Compliance Training and Awareness

The NTT DATA Group is making an effort to steadily enhance compliance awareness among employees through various types of training. To improve issues in the workplace, we will enhance educational material content and implement thorough training sessions for all employees.

Efforts to promote compliance awareness among employees

The NTT DATA Group conducts compliance training (including e-learning) for approximately 38,000 employees at domestic Group companies and approximately 112,000 employees at overseas Group companies. The Company also arranges lectures on corporate ethics at position-based training sessions conducted as part of promotional milestones. Our compliance-related training is tailored to the business characteristics of each organization and Group company.

   Also, given the growing global reach of our business activities, we enrich our training content to foster greater awareness about stricter anti-bribery and anticorruption regulations in the global business community and draw attention to outsourcing contracts in view of regulatory revisions. Furthermore, we created and provided employees with the "NTT DATA Group Ethics Guide: Learning About Compliance through Familiar Cases" to explain examples of ambiguous cases that one may likely to face in one's daily operations, with the aim of promoting further understanding of our Global Compliance Policy. This guide is posted on our intranet site so that it can be referred to and used as needed.

▶ Major Compliance Initiatives Undertaken in Fiscal 2018

Name of Training Session	Number of Attendees	Ratio
Compliance IBT training (e-learning)	Approx. 38,000 (Domestic employees)	99.4%
Global Compliance Policy Training	Approx. 112,000 (Overseas employees)	98.7%
Position-based group training sessions (Lectures on corporate ethics, risk management, etc.)	Approx. 2,800	96.9%

Initiatives on Human Rights

Respect for Human Rights

As a member of the NTT Group, the NTT DATA Group is engaged in an organizational effort in line with the NTT Group's Human Rights Charter, established in June 2014, which incorporates the concepts of the ISO 26000 international standards on social responsibility and the UN Guiding Principles on Business and Human Rights. Our Global Compliance Policy stipulates the Group's fundamental principle of respect for human rights. We pledge not to carry out or tolerate discrimination and take a firm stand against discrimination by others, aiming to pursue a comfortable work environment free from any form of discrimination. We place a great importance on resolving human rights issues as we are promoting human rights awareness activities organizationally throughout the Group.

The NTT Group's Human Rights Charter

We recognize that the respect for human rights is a corporate responsibility and aim to create a safe, secure and rich social environment by fulfilling its responsibility.

1. We[1] respect internationally recognized human rights[2], including the Universal Declaration of Human Rights in all company activities.

2. We responsibly respect for human rights by efforts to reduce any negative impacts on human rights holders. We respond appropriately when negative impacts on human rights occur.

3. We aim to not be complicit in infringing human rights, including being involved in discrimination, directly or indirectly.

4. When negative impacts on human rights are done by a business partner and are linked to a product or service of the NTT Group, we will expect them to respect human rights and not to infringe on them.

Notes:1. "We" means the NTT Group and its officers and employees.
2. "Internationally recognized human rights" are rights included in declarations and rules that form the basis for international standards of universal human rights throughout the world and specifically refer to the following. United Nations (the Universal Declaration of Human Rights and the two Covenants on human rights)
· The Universal Declaration of Human Rights (adopted by the United Nations General Assembly in 1948)
· International Covenant on Economic, Social and Cultural Rights and the International Covenant on Civil and Political Rights (adopted by the United Nations General Assembly in 1966, in force from 1976) International Labour Organization (eight basic principles of the Core Conventions of the ILO Declaration)
· The eight core principles of the ILO Declaration on Fundamental Principles and Rights at Work (adopted at the 86th International Labour Conference in 1998) are: Forced Labour, Freedom of Association and Protection of the Right to Organize, Right to Organize and Collective Bargaining, Equal Remuneration, Abolition of Forced Labour, Discrimination (Employment and Occupation), Minimum Age Convention, and Elimination of the Worst Forms of Child Labour.
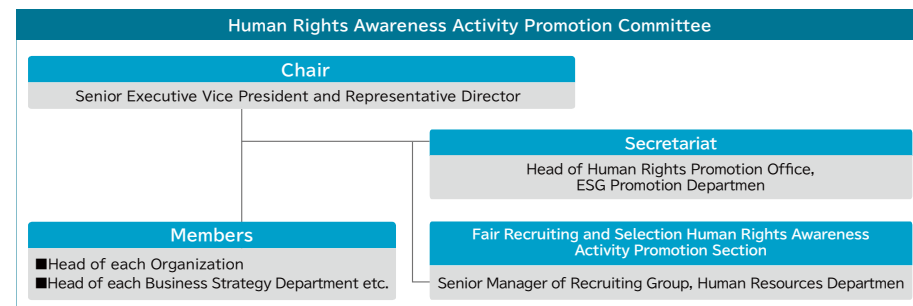Notes: In carrying out article 2 through 4 above, we apply UN Guiding Principles on Business and Human Rights and ISO26000 and are subject to the procedures described therein.

Message from the CEO | Company Data | Sustainability in the NTT DATA Group | Efforts to Make Social Contributions through Businesses | Social | Environment | Governance | GRI Standards

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Establishing a System to Promote Human Rights Awareness Activities

With the aim of realizing cheerful and comfortable workplaces by raising awareness and understanding of human rights, NTT DATA convenes a meeting of the Human Rights Awareness Activity Promotion Committee at the beginning of each fiscal year. The committee consists of leaders of each organizational unit and is headed by a senior executive vice president and representative director.

Those in charge of promoting human rights awareness activities have been assigned in each of our organizations and Group companies. They promote relevant employee training and measures in cooperation with the Human Rights Promotion Office in the ESG Promotion Department and also address human rights issues within our respective organizations. In addition, we develop these human rights awareness experts by having them participate in internal and external training sessions.

▶ System to Promote Human Rights Awareness Activities

Human Rights Awareness Activity Promotion Committee

Chair
Senior Executive Vice President and Representative Director

Secretariat
Head of Human Rights Promotion Office, ESG Promotion Departmen

Members
■Head of each Organization
■Head of each Business Strategy Department etc.

Fair Recruiting and Selection Human Rights Awareness Activity Promotion Section
Senior Manager of Recruiting Group, Human Resources Departmen

Promoting Human Rights Awareness

To further deepen understanding and heighten awareness of human rights, awareness-raising activities are important for all employees. Following this concept, we have been holding Human Rights Awareness Workplace Seminars at the workplace level for domestic NTT DATA Group employees since fiscal 2010. With these seminars, we aim to raise awareness and promote understanding regarding human rights issues.

Additionally, in 2018 we continued to conduct sessions on human rights in position-based training, recruiters' training, and other programs to inculcate even deeper awareness. In response to the increasing number of employees assigned to overseas posts, we conducted pre-overseas assignment training to ensure their proper understanding of the religions, cultures, and customs of the countries and regions to which they have been assigned. In fiscal 2018, a total of 45 employees assigned to one of 11 overseas posts took part in the program. Also,

in October 2018 we held a human respect slogan contest for NTT DATA Group employees, partner company employees, and family members from whom we solicited slogans on the theme of human rights awareness. We received 208 entries for the contest and awarded outstanding slogans at an event during the United Nations-designated Human Rights Week in December.

▶ Major Initiatives on Human Rights Awareness

Example Initiatives	Participation in Fiscal 2018
Human rights awareness workplace seminars	27,980 people
Position-based training course (Human rights awareness)	2,100 people
Recruiters' training course	500 people
Training experts (in charge of promoting human rights awareness activities and the HR section in the ESG Promotion Department)	13 people (6 sessions)
Training prior to international assignment	45 people (11 countries)
Human respect slogan contest (Number of applications)	208 applications

Human rights due diligence and Related Initiatives

As an NTT Group company, we are incrementally implementing our human rights due diligence process in accordance with the policies set forth in the NTT Group's Human Rights Charter established in fiscal 2014. Specifically, we established a human rights management system in the first period (2014-2016) and strengthened human rights management in the second period (2017-2018).

Strengthening Human Rights Management System

In fiscal 2017, in order to verify the results of internal investigation, NTT assessed across the its Group the degree of potential negative impact of the group's business on the human rights of its stakeholders by examining the likelihood of human rights risks in each country and the impact of potential human rights risks that may be caused by the group's business. Based on this assessment, as well as advice from external expert organizations and good practices of other companies, we identified human rights issues that need to be addressed on NTT group level.

In fiscal 2018, the NTT Group conducted an assessment on its apparent impact on human rights in the Asian region to verify the results of a potential human rights risk assessment implemented in the previous year.

Going forward, NTT Group will re-examine risk mapping results in all the regions the Group operates and while it evaluates and analyzesthe Group's most common issues and priority issues, the Group will focus on strengthening its governance system to enhance its due diligence processes.

Measures in Response to the UK Modern Slavery Act

NTT DATA UK established compliance policies based on the United Kingdom's Modern Slavery Act (MSA), which was passed in March 2015. Listed below are ways in which we have implemented these policies:

- Recruitment and checks against the MSA for all activity.
- Our terms and conditions of purchase require all suppliers to comply with the MSA.
- Procurement checks of our top suppliers on a regular basis for compliance to a number of business and regulatory requirements including the MSA.
- Checks performed since 2015 confirmed compliance with the MSA. Other suppliers are checked dependent on due diligence and risk assessments undertaken. Swift action is taken for noncompliance which could include immediate order termination.
- We have an external whistleblowing service which can be used to register non-compliance.
- Training is performed on an as required basis.
- NTT DATA UK's obligation to comply with government regulations is communicated to staff on a regular basis and compliance is reviewed by the directors on an annual basis.

Risk Management

To continue fulfilling our responsibilities to clients and society, we identify and rigorously manage risks.

Policy and Structure

The NTT DATA Group seeks to ascertain all risks associated with its business activities to minimize the frequency of occurrence of these risks and limit their impact on operations should they materialize. To facilitate this effort, in 2002 we appointed an officer in charge of supervising and promoting risk management from a Companywide perspective.

In addition, risk management promotion officers were appointed to the Risk Management Division as well as other divisions and Group companies to enable them to respond proactively and independently to various risks.

NTT DATA defines material risks and reviews progress toward addressing these and achieving related targets with the results of such reviews being reflected in various measures. The Internal Control Committee convenes twice every year to discuss measures pertaining to the reduction of risks and evaluate their effectiveness. The results of these evaluations are reported to the Corporate Management Committee as well as the Board of Directors.

Furthermore, since the NTT DATA Group provides various services worldwide to a wide range of clients and industries, each business unit has its own unique business environment. Therefore, the Board of Directors has delegated considerable power to sector heads. This measure enables proper understanding of and prompt responses to risks relating to client relationships and market environments.

▶ Risk Management Structure
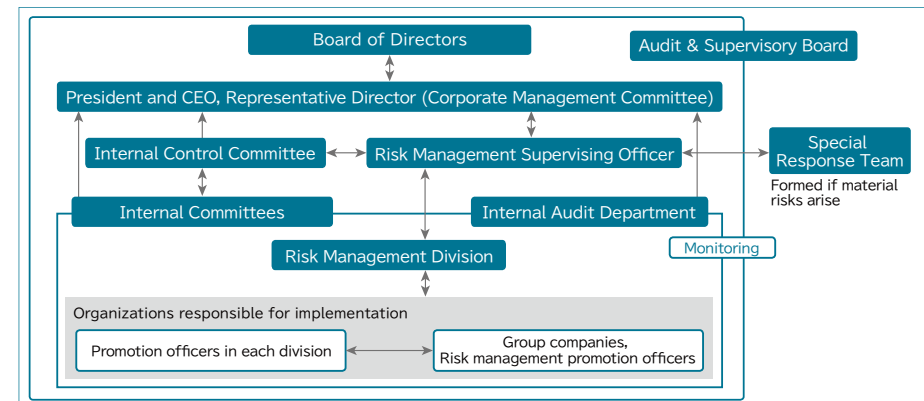
Risk Management Method

NTT DATA identifies risks that may impact its Head Office, regional head office, and individual Group companies and strategize measures accordingly. The Risk Management Division analyzes, evaluates, and monitors the risk management of the entire Group. Risks determined to have the potential to impact the entire Group are defined as global-control risks and are managed stringently and thoroughly on a Groupwide basis. Additionally, the Group considers material risks set by regional head office and other entities to be "region-control risks" and maintains an evaluation and improvement cycle based on the implementation statuses of countermeasures and on risk occurrence incidents.

▶ Risk Management Categories
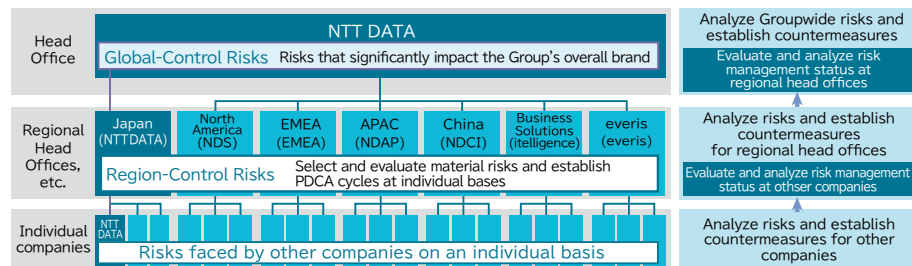
Global-Control Risks

Global-control risks with the potential to impact the entire Group are identified by the Internal Control Promotion Committee in consideration of changes in social trends and input from outside specialists. In fiscal 2018, we continued addressing the same risks as those in the previous fiscal year as a medium- to long-term effort under the initiative of NTT DATA's Head Office.

▶ NTT DATA's Global-Control Risks

Material Risks	Major Improvements, etc.	Initiatives
Information leakage, personal / confidential information, cyberattacks	● Strengthen response to the increasing number of advanced cyberattacks	● Stimulate awareness through training ● Revise security rules at the global level ● Strengthen the support organization to minimize damage in the event of an incident ● Ensure thorough compliance with the EU's General Data Protection Regulation (GDPR)
Accounting fraud, including window dressing	● Ensure thorough operation of IFRS-based unified rules ● Expand the scope of risk indication auditing	● Promote introduction of unified accounting rules and check financial process (control activities) structure and operation ● Stimulate awareness through training ● Expand the types of fraud subject to risk indication auditing and promote risk indication auditing at Group companies
Bribery	● Continue strengthening compliance education	● Stimulate awareness through training (Japan: Implement Internet-based testing (IBT) for compliance and position-based training, Overseas: Conduct training at individual locations)

Region-Control Risks

Region-control risks managed independently by regional head offices define material risks based on approximately 40 risk candidate items in each region that are evaluated and improved in light of material risk countermeasure implementation and risk occurrence status.

▶ Process for Selecting Region-Control Risk
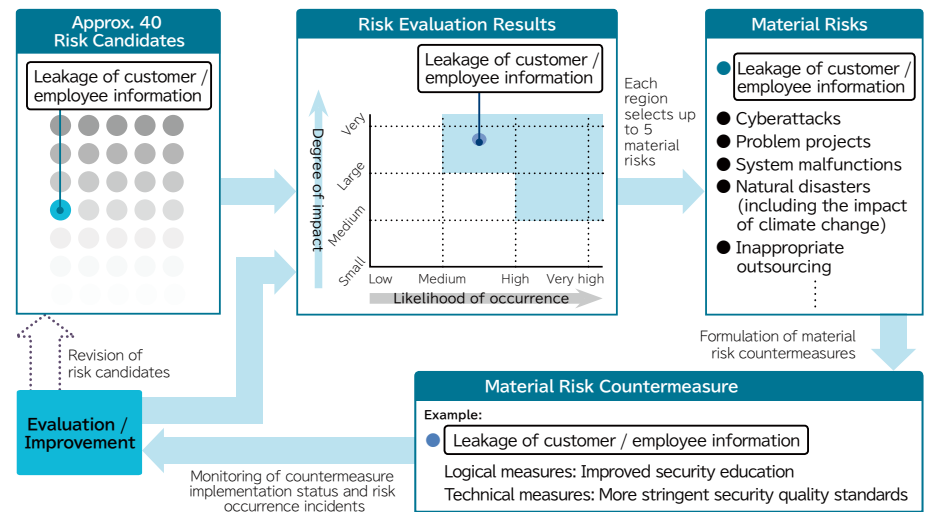
Risk Management Training

The NTT DATA Group conducts ongoing training regarding the legal and other roles of newly appointed directors and Audit & Supervisory Board members at NTT DATA and Group companies to ensure thorough risk management throughout the Group. During fiscal 2018, we provided training to newly appointed directors at the time of their appointment concerning their duties and responsibilities with regard to corporate governance and under the Companies Act. In August of the same year, we also conducted training for executives of Group companies in Japan. Later, in August of the same year, we also provided training for Company executives at domestic Group companies. Going forward, we will promote increased risk management awareness and enhanced response capabilities by implementing various types of training on an ongoing basis.

Information Security

The NTT DATA Group is constantly striving to enhance its information security mainly through technical development that keeps the Group abreast of social, technological, and business trends as well as of the latest trends in security. The results of these efforts are reflected in the Group's systems and client services.

Basic Policy

The more pervasive IT becomes in our lives, the more risks we face with regard to the safety of information and the greater the necessity for appropriate measures to safeguard that information. In the business world, however, focusing solely on ensuring information security hinders the active utilization and sharing of information and stymies the use of beneficial information and know-how.

The NTT DATA Group recognizes the importance of achieving an appropriate balance between ensuring the safety of information and the active utilization and sharing of information. We implement a wide range of measures that cover both the logical and technological aspects of information security. Logical measures include formulating rules and providing education and training in information security, while technological measures involve solutions that prevent information leaks and the adoption of thin-client computing.
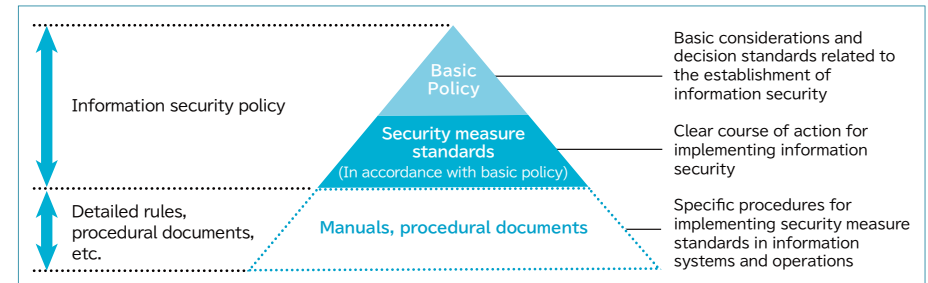
Our information security personnel come together in forums to facilitate Groupwide sharing of knowledge and know-how. Through this distribution of knowledge within the Group, we are working to establish unified information security governance.

NTT DATA Group's Unified Information Security Policy (GSP)

The NTT DATA Group is well aware that information leakage caused by security breaches and other incidents, as well as unauthorized use of information, can pose a serious threat to the Group's credibility. Based on this awareness, we make sure to handle our information assets appropriately in accordance with the unified code of conduct. We also implement the NTT DATA Group Security Policy (GSP) to ensure safe information distribution throughout the Group. Each Group company has formulated an information security policy based on the GSP. For business partners to whom we outsource software development and other tasks, we ensure that they abide by our rules established to prevent information security incidents.

Our information security policies stipulate not only our basic principles, but also security measure standards that reflect the basic principles and indicate a clear course of action. Apart from the information security policies, we also have manuals and procedural documents in place which set forth specific procedures for implementing the security measure standards in our business operations.

▶ Information Security Policy Configuration

Information security policy — Basic considerations and decision standards related to the establishment of information security

Basic Policy

Security measure standards (In accordance with basic policy) — Clear course of action for implementing information security

Detailed rules, procedural documents, etc.

Manuals, procedural documents — Specific procedures for implementing security measure standards in information systems and operations

Information Security Management System

In order to deal with information security risks and establish information security governance, NTT DATA has appointed executives who promote information security management from a Companywide point of view and has built an information security management system. The main organizations and their functions are listed below.

Furthermore, to reinforce information security on a global scale we operate a global security governance system centered on regional head offices that is similar to the system in place for business management. NTT DATA regularly reviews the information management conditions of each regional head offices on a quarterly basis to maintain an understanding of management circumstances and provide support for maintaining and enhancing the level of control.

Since fiscal 2015, we have held workshops aimed at strengthening our initial response in the event of an incident.

▶ Main Organizations and Functions for Information Security Governance

Organization	Functions
Information Security Committee (Assessment / Steering)	Chaired by the chief information security officer and made up of the heads of business units. Monitors and evaluates Companywide activity status and issues, and determines Groupwide information security strategies.
Information Security Office (Promotion and monitoring)	Promotes the decisions of the Information Security Committee and confirms the status of progress. Designates information security promotion officers at each worksite.
NTTDATA-CERT (Backups)	Organization for preventing information security incidents[1] and responding to any incidents that might occur. Joined the Nippon CSIRT Association as well as the Forum of Incident Response and Security Teams (FIRST)[2], a global computer security incident response team (CSIRT) community to collect a wide range of information on security trends in Japan and overseas and utilize it toward improving the security of our own systems.

*1: Actualization of security threats related to information management and system operation, such as computer malware infection, unauthorized access, and information leakage
*2: A global community consisting of approximately 400 or more CSIRTs from government agencies, educational institutions, companies, and other organizations

▶ Information Security Management System
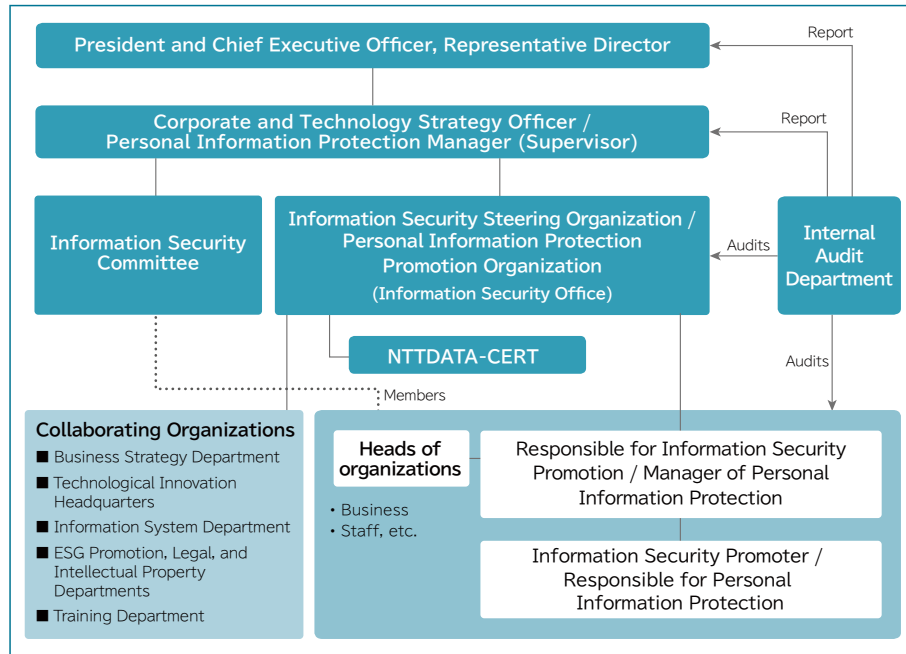
Acquisition of Information Security Management Certification

At NTT DATA Group companies, each unit that handles confidential information and personal information acquires ISO/IEC 27001 certification—the international standard for information security management systems (ISMS)—as an organization, as necessary. As of March 31, 2019, 42 Group companies, including NTT DATA, have acquired this certification in Japan. Several overseas Group companies, for example in Europe, China, and India, have also obtained ISO/IEC 27001 certification.

In addition, 41 Group companies, including NTT DATA, have been granted the right to display the PrivacyMark of the Japan Institute for Promotion of Digital Economy and Community (JIPDEC).

Information Security Governance
## Global Governance

The NTT DATA Group has been diligently working to secure information security based on the NTT DATA Group Security Policy (GSP) since fiscal 2006. The GSP has been applied to the Group's overseas locations as well. A global framework for promoting information security has been built since fiscal 2012, centered around the six regional head offices in North America (NDS), EMEA (EMEA), APAC (NDAP), China (NDCI), Business Solutions (itelligence), and Spain and Latin America (everis). Information security is managed based on unified baselines as well as in a flexible manner that meets the specific needs of each region.

Global Security through Collaboration

To ensure thorough information security governance globally, information security is managed at the three levels of information security steering organizations at the Head Office, regional head offices, and individual Group companies.

The information security steering organizations at each level cooperate closely to maintain and develop information security policies, monitor information security measures, respond to emergencies, and take preventive measures against incidents.

▶ Global Information Security Governance Structure
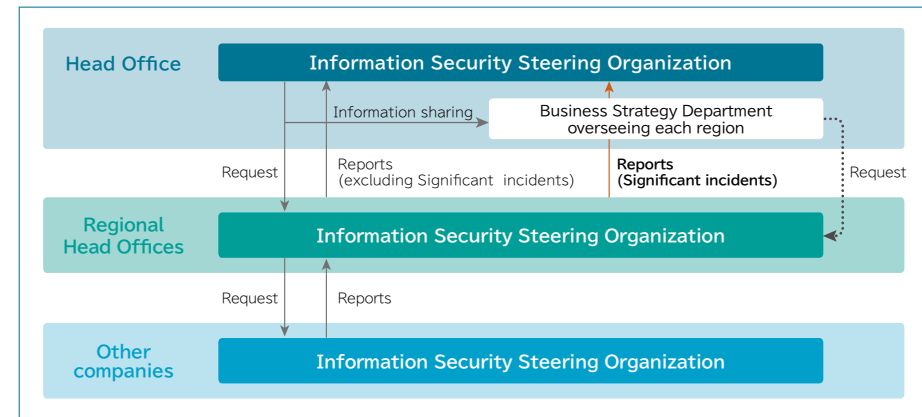
CSIRT Management within Internal Organizations

The NTT DATA Group is managing NTTDATA-CERT as an organizational CSIRT to prevent the occurrence of security incidents through its day-to-day activities. NTTDATA-CERT works to detect incidents early and provide quick and appropriate emergency response.

Activities in Preparation for New Security Risks

We established NTTDATA-CERT in July 2010, after collecting the CSIRT activities that had been implemented internally in each business sector since 2000. NTTDATA-CERT's primary activities include wide-ranging gathering, analysis and communication of information related to the newest attack methods and incident occurrences, communication monitoring, emergency response, research and development, and collaboration with external organizations. We are working to bolster our ability to respond to the most current risks as cyberattack targets and methods change each year.

Collaborative and Wide-Ranging Domestic and International Activities

The scope of NTTDATA-CERT's activities extends beyond the limits of the NTT DATA Group. The team is widely collaborating with external security organizations, including the JPCERT Coordination Center (JPCERT/CC) and CSIRT teams from all member companies of the Nippon CSIRT Association (NCA).

   With these efforts, we are quickly sharing security-related information and enabling early detection and response to security concerns.
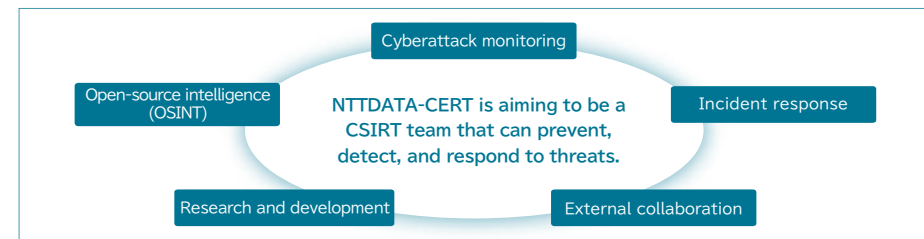
Activities Utilizing OSINT

We adopt an open-source intelligence (OSINT) approach when operating NTTDATA-CERT, which involves actively utilizing information obtained lawfully through mediums including official government announcements and mass media, such as reporting, academic articles, and technical data. Information collected daily is analyzed by NTTDATA-CERT's experts, who then predict future security trends and distribute their findings to all companies in the NTT DATA Group through quarterly reports and security-related news briefings.

   Additionally, the NTT DATA Group uses this information in its security strategies and countermeasures, including cyberattack monitoring intensification and the selection of new research and development themes for the next fiscal year.

Incident Response Workshop

We hold workshops for Group companies to ensure that they can provide an appropriate initial response to an incident on site. The workshops are conducted based on our initial response guidelines and designed to help the staff understand the goals of initial incident response and what each of them must do and deepen their knowledge regarding the targets and methods of cyber attackers through examples of incidents that occurred within the NTT DATA Group.

▶ NTTDATA-CERT's Vision

NTTDATA-CERT is aiming to be a CSIRT team that can prevent, detect, and respond to threats.

- Cyberattack monitoring
- Open-source intelligence (OSINT)
- Incident response
- Research and development
- External collaboration

Auditing and Monitoring System

Since 2006, the NTT DATA Group has been diligently working to secure information security in accordance with its GSP. We are also establishing auditing and monitoring systems at domestic and overseas Group companies.

   The Company has been pressing forward with initiatives related to security auditing while focusing on three points of view: thoroughness of basic operations, external fraud countermeasures, and response to internal fraud.

   Moving forward, we will continue to pursue thoroughness of basic operations and pay particular attention to fraud response measures.

1. Thoroughness of basic operations
   We verify the management statuses of internal organizations and systems that process personal information based on our GSP.

2. External fraud countermeasures
   In order to respond to increasingly sophisticated and complicated cyberattacks, we check the statuses of system countermeasures at Group companies.

3. Response to internal fraud
   We confirm the statuses of system response measures to ensure proper reaction to and prevention of internal fraud.

▶ Internal Auditing System

Group companies (individual)	**Performed annually and internally in accordance with GSP**
	• Audits are performed on targets selected based on results of risk evaluations. • In addition to auditing based on our GSP, we began to audit systems for internal fraud in 2015.
	• We monitor audit items shared between Group companies.
NTT DATA (Head Office)	**Internal Audit Department**
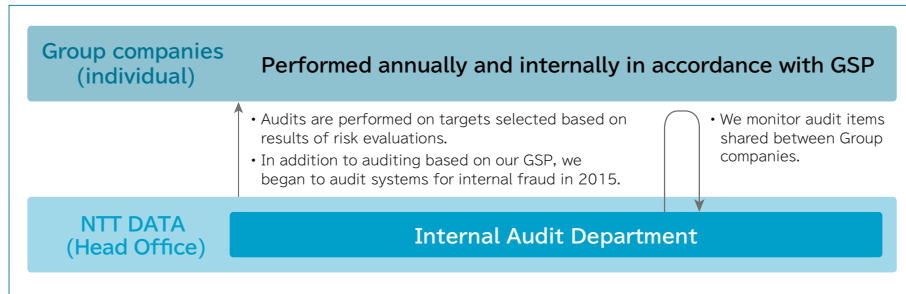
Information Security Strategies
Key Strategies in Fiscal 2018

Practicing and maintaining an appropriate balance between ensuring safety of information and actively utilizing and sharing information, both of which are objectives of the GSP, is essential if the NTT DATA Group is to continue to be a partner to customers that aids in their evolution.

In fiscal 2018, we focused on the issue of improving security governance in NTT DATA's global management and, as specific measures to address this issue, worked on building a global security infrastructure and accelerating escalation for the management of a serious incident. To prepare within the Company for cyberattacks, which are becoming increasingly sophisticated and complex, we also worked to develop an IT infrastructure that will enable us to speed up incident response.

Building of Global Security Infrastructure

To counter increasingly sophisticated cyberattacks, we have established a Groupwide infrastructure that strengthens security across NTT DATA Group locations in and outside of Japan. The infrastructure comprises, firstly, the centralized management of Internet connection points, which makes it possible for us to maintain a constant security level for the entire NTT DATA Group. Secondly, a network with enhanced safety that enables the NTT DATA Group to block connection between its locations in and outside of Japan as necessary. This allows us to prevent the damage from spreading to other areas in the event of an intrusion. Thirdly, an advanced log analysis solution that enables us to detect even advanced persistent threats (APTs). We have introduced this solution throughout the NTT DATA Group.

Establishment of an Escalation System to Manage Significant Incidents

To facilitate the management of Significant incidents, we have established a common escalation system for NTT DATA Group locations in and outside of Japan by setting global security rules that clearly stipulate early detection and reporting. We also have incident response organizations organized hierarchically, allowing an incident that a lower-level organization cannot handle to be escalated to the next-level organization for support. This system helps us secure the ability to quickly respond to incidents on site as well as to address very difficult incidents.

Thanks to these escalation arrangements, roles, responsibilities, and reporting standards in the event of a serious incident have been clarified, and prompt reporting from the overseas regional head offices to the Head Office has been ensured.

Establishment of an IT Infrastructure That Enables Quick Response to Incidents

To prevent incidents such as sophisticated cyberattacks and massive malware infection, NTT DATA has to date put its efforts into reinforcing security of its internal IT infrastructure, such as strengthening terminal security and building a mechanism to constantly monitor the characteristic behaviors of malware.

We have also reviewed and improved our initial response to malware infection by building a mechanism to separate and control the network environment at an early stage and introducing endpoint detection and response (EDR)[1]. EDR automates security patch management on a terminal-by-terminal basis and applies patches to unpatched terminals remotely. EDR can also detect and automatically isolate unpatched terminals.

[1]: Endpoint detection and response (EDR): A product that supports the handling of incidents by centrally managing terminals and analyzing infected terminals and executing countermeasures collectively

Information Security Education and Training
Initiatives Aimed at Spreading Understanding among Employees and Others

The NTT DATA Group provides information security education for employees, business partners, and temporary workers. We have delivered this education and training via e-learning and classroom instruction to promote understanding of the Group's policy on the protection of personal information, the rules contained in the GSP, and the need to be constantly aware of the importance of information security in one's work. In fiscal 2018, we continued implementing a broad range of measures with the primary aim of ensuring that every employee is aware of the basic actions required to maintain information security.

▶ Information Security Training Offered in Fiscal 2018

Target	Content and Format	Participation	
All employees	Information Security and Personal Information Protection Training (e-learning; in three languages)	Target	100% employee completion (11,527 people)
		Achieved	100% employee completion (11,527 people)
Position based	Information security lectures Onsite learning	Incorporated in position-based training conducted by the Human Resource Department	
	Internal Security training for qualified personnel (e-learning)	Learning materials were provided online to applicable personnel.	
Business partners and temporary staff	Personal Information Protection Introduction Training / Information security education (e-learning)	Target	100% of all parties registered on our company system (26,302 people)
		Achieved	100% of all parties registered on our company system (26,302 people)
	Information Security Training Handbook	Booklets available to new business partners and temporary staff via download	

▶ Information Security Training at Key Group Companies in Fiscal 2018

Target	Implementation Format	Participation
Group company employees, business partners, and temporary staff	GSP security training and personal information protection training (e-learning; in three languages)	Domestic Group companies 67 companies, 29,979 employees Overseas Group companies 25 companies, 4,375 employees

Response to Security Incidents Involving the Leakage of Personal Information

NTT DATA maintains personal, confidential, and business information. When this information leaks, it poses the threat of damaging our social credibility and brand image. Leaks may also have negative impacts on the Group's operating results and financial conditions through, for example, payments for damages. We are engaging in the following initiatives aimed at predicting and alleviating these security risks.

There were no substantiated complaints concerning breaches of customer privacy or loss of customer data in fiscal 2018.

Management system	We established a system led by the Corporate and Technology Strategy Officer, in which the Information Security Committee comprehensively evaluates activities conducted during the fiscal year under review.
Auditing and monitoring system	The Company established a governance monitoring system that covers domestic and international Group companies and operates from three points of view: thoroughness of basic operations, external fraud countermeasures, and response to internal fraud.
Incident response	We are operating an organizational CSIRT that works to detect incidents early on and provide quick and appropriate emergency response.
Human resource development	The Company is strengthening both e-learning and onsite learning to develop human resources well-versed in security.

Disaster and System Failure Countermeasures

The NTT DATA Group provides many information systems and services that support social infrastructure. Therefore, a system shutdown or interruption of services in the event of a disaster would have an enormous impact on society and people's lives. Therefore, we strive to constantly improve our disaster BCP as well as contingency plans for systems and services related to social infrastructure. Since the Great East Japan Earthquake, we have particularly sought opportunities where we can apply the lessons we learned from this difficult experience.

▶ Structure for Responding to Earthquakes and Other Large-Scale Natural Disasters
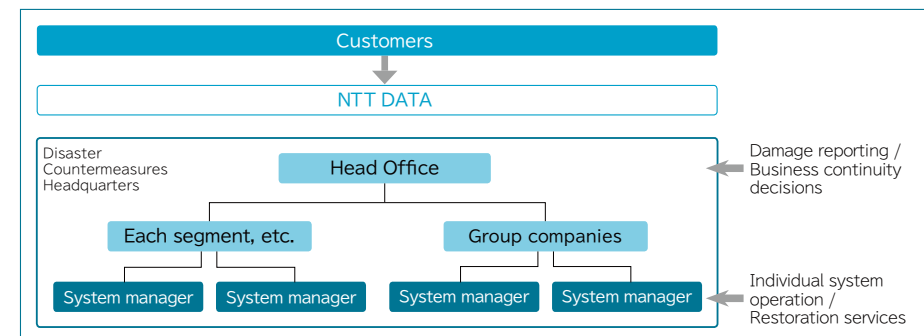
Plans and Systems Responsive to Disaster-Related Risks

As in the case with the Great East Japan Earthquake, we face the risk of disasters of greater scale and diversity, which further raises the importance of plans and systems for response.

NTT DATA has "Disaster Business Contingency Plans (BCPs)" and "Contingency Plans" in place, and conducts various drills and trainings to ensure that the Company can swiftly ensure the continuation of its business after a disaster.

We hold Companywide drills for all employees, including drills for confirming personal safety and setting up the Disaster Countermeasures Headquarters at the Head Office. Furthermore, each organization conducts separate drills that reflect the nature of their respective operations in an effort to minimize disaster risks.

Protecting our buildings, electrical systems, air conditioners, security, and various functions of our data centers is vital for the operation of information systems. For this reason, we have obtained certification for ISO 22301:2012, an international standard for business continuity management, at all Group-owned buildings and have established a system able to respond in the event of a large earthquake, widespread power outage, or similar incidents.

* As of March 31, 2019

System Failure Countermeasures Focusing on Prevention and Response

Information systems have developed to the point where they have become infrastructure that supports people's daily lives and industry, so if there were some sort of system failure it could have an enormous impact on everyday tasks and business.

As an IT company that operates many large-scale systems that support society, the NTT DATA Group is advancing extensive system failure response measures based on the dual perspectives of prevention and response. These measures include inspections based on a comprehensive perspective in line with the Information Technology Infrastructure Library (ITIL), ISO 20000, and other standards, deployment of response know-how at the time of a failure, and development of IT service managers. To ensure NTT DATA and NTT DATA Group business continuity when a disaster occurs, we formulated a BCP and regularly review education, training, and business continuity planning as each organization must be able to recover operations as quickly as possible and restore business to standard levels in a short period of time.

The NTT DATA Group will also continue renewing and reinforcing measures against failures caused by security breaches, which have become a growing social problem in recent years.

Human Resource Development Targeting Stable System Management

NTT DATA's Quality Assurance Department is promoting IT-SM community activities as one of its human resource development policies. These activities are aimed at stabilizing system management and maintenance through the development of related personnel.

Our IT-SM community activities include IT service management improvement training, which involves learning through examples of system failure response and prevention, and IT-SM community seminars, which provide a venue for sharing and announcing these examples. Additionally, we are providing support through our IT-SM training (mentoring) school for IT service managers. At this school, two executive IT service managers serve as mentors, passing on skills and expertise, providing psychological support (discussion of concerns), and helping out with personal network building (vertical relationships between IT service managers).

Furthermore, we are supporting and developing personnel involved in system operation and maintenance by offering various tools. These include: standardized on-site inspection checklist for stable system operations; a portal site that provides know-hows for stable system operations and IT service management; a collection of example failure cases for recovery exercise; a system development guide aimed at improving operational quality during their development phase; and a guide for reducing human errors that presents well explained strategies and case studies.

Tax Strategy

The NTT DATA Group has established tax policies for ensuring compliance with tax-related laws and regulations throughout the Group, including overseas Group companies.

Tax Policy

We established our basic policy on tax affairs in view of the growing importance of adopting a global perspective on properly addressing and managing tax risks posed by the increasingly multinational nature of our Group companies, which include regional head offices, and the increase in international transactions brought about by the rapid globalization of our business.

Tax Payments and Reporting

The NTT DATA Group pays appropriate taxes related to business operations in accordance with tax-related laws and the regulations of each country and region. In fiscal 2018, corporate taxes amounted to ¥49,210 million, a tax burden of 33.50% on pretax profit.

Raising the Awareness of NTT DATA Group Employees

We have established internal regulations and provide guidance on appropriate tax treatment to employees with respect to tax affairs. The NTT DATA Group (consolidated subsidiaries) has established basic guidelines on taxation and strives to thoroughly observe laws and regulations and reduce tax risks through employee education, guidance, and operational improvements.

Relationship with Tax Authorities

We have established relationships of trust with tax authorities by providing appropriate and timely information and consulting on accounting procedures. In the event that issues are discovered by tax authorities, we immediately work to determine their causes, except in cases that involve litigation or formal protests made regarding the actions or viewpoints of the same authorities. We then prevent recurrences by adopting appropriate corrective and reform measures.

Brand Management

To promote its global business, the NTT DATA Group is conducting PR activities and surveys to attain sufficient recognition for its corporate brand.

Policy on Branding Activities

In view of our business history, we have formulated separate policies for corporate branding activities in Japan and overseas.

1. Overseas (Global Market)
   Given that NTT DATA's recognition rate is still low, we will develop activities to promote the Company name and business activities with the aim of improving awareness.
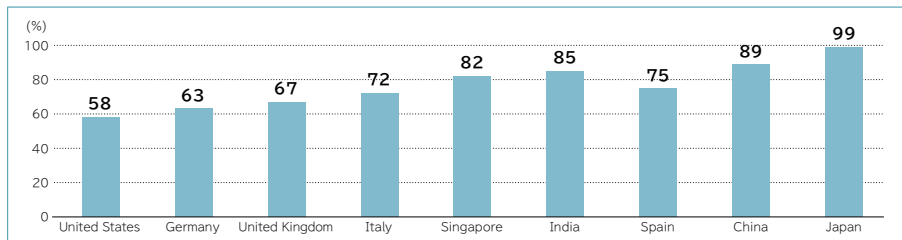
2. Japan (Domestic Market)
   We will further enhance understanding and affinity for NTT DATA and aim to enhance corporate value and improve our brand image by co-creating with customers through our latest technologies.

NTT DATA Brand Awareness Surveys

We conduct surveys on the brand awareness level of NTT DATA in nine key countries to monitor the level of awareness, understanding of our business, and development of our corporate image. These awareness level surveys are conducted in key countries in the four global regions in which we have regional head offices. While taking into account the characteristics of each market, the surveys provide data on the level of awareness, which is an important basic measure used in the planning of our business activities. In conducting the surveys, we also monitor differences between NTT DATA and competitors so that the results of the surveys can be more effectively utilized for our business development.

▶ Brand Awareness from People Involved with IT from Countries with Major Markets[1]

(%)	United States	Germany	United Kingdom	Italy	Singapore	India	Spain	China	Japan
	58	63	67	72	82	85	75	89	99

[1]: Percentage of people involved with IT who indicated, through survey responses, that they had seen or heard NTT DATA's company name before

Cases of Advertising or Marketing Offenses

NTT DATA was not involved in any offenses related to the Act against Unjustifiable Premiums and Misleading Representations in fiscal 2018.

GRI Standards

GRI Sustainability Reporting Standards Index

▶ Universal Standards

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* The information shown here is provided in reference to categories in the GRI Standards; it is not disclosed in conformance with the GRI Standards.
* Unless otherwise stated, topics are based on FY2016 edition.