SDGs ACTION BOOK 2022

NTT COMWARE

Exploring New Horizons, Achieving Sustainable Impact

Message from the President

Continuing to Create New Value with the Power of Technology to Achieve a Sustainable Society

Accelerating Transformation and Evolution

NTT COMWARE has entered a period of major change. In January 2022, joining with NTT DOCOMO and NTT Communications, we began anew as a part of the New DOCOMO Group. In July, we merged with DOCOMO Systems, Inc., and DOCOMO Datacom, Inc. became a member the COMWARE Group, thereby creating a new COMWARE Group.

This new NTT COMWARE, with a new set of teammates, will work to further focus its management resources in order to quickly provide highly innovative services to customers and accelerate the digital transformation (DX).

On the occasion of our 25th anniversary, under this new NTT COMWARE framework, we have reformulated the main message we wish to convey internally and publicly. The message has two components: the COMWARE Identity, which expresses our raison d'être, the values we embrace, and our highest aspirations as a company, and the Corporate Message, which is the ultimate expression of the kind of company we are. These were created together with our employees and communicate in a new form the intentions of NTT COMWARE.

In order to fully embody the ideal expressed in the COMWARE Identity, we created the COMWARE New Declaration and NTT COMWARE Group Sustainability Policy. The new declaration sets forth a specific direction for the business activities NTT COMWARE will pursue through fiscal 2027, and the sustainability policy delineates the distinctive stance of NTT COMWARE with respect to sustainability activities, which are intimately connected to our business.

In order to successfully integrate solutions to environmental and social issues into business activities that generate economic value and achieve a sustainable society through the creation of new value, each individual within the new NTT COMWARE, from the management team on down, will maintain an awareness of our mission going forward as we evolve as a company.

To Carry Out Our Unchanging Mission

Though we are accelerating our evolution, our core mission remains unchanged: to continue to create new value with the power of technology, starting with our software development capabilities.

The world is currently going through turbulent times. On the social front, the penetration of DX continues in connection with more widespread use of ICT and AI, and new social systems are being created on a full-fledged basis in response to the "new normal" of the pandemic. On the environmental front, there is significant demand for innovation and infrastructure upgrades in order to create a highly cyclical society that is low carbon or carbon-free. Such initiatives, directly connected to the SDGs, are creating major momentum.

We will continue moving forward together with all of you and will generate synergies within the DOCOMO Group and with NTT Group companies, taking on the challenge collectively of creating value that addresses social issues and fulfilling our commitment to "Changing worlds with you."

Masato Kuroiwa

Masato Kuroiwa

President
President, Executive Officer
NTT COMWARE CORPORATION

NTT COMWARE's New Message and Sustainability

NTT COMWARE reformulated its core message, communicated internally and publicly, in September 2022 on the occasion of its 25th anniversary.

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With a wholehearted commitment to supporting Japan's communications infrastructure and transforming people's lives, we will continue to provide optimal solutions to customers.

COMWARE Identity

We design the future with the power of technology, shaping a prosperous world of connected hearts.

Commentary

With the aim of realizing a prosperous and sustainable world in which anyone can enjoy excitement, joy and security, we will envision and give shape to a future that is beneficial to people and society, freely connecting all manner of people, things and experiences with the power of technology, including our software development capabilities.

The quality and reliability that has supported social infrastructure in Japan. Based on the strengths we have cultivated to date, always changing, and continuing to deliver new value to customers and the greater world as a group of professionals going beyond our own boundaries to drive innovation.

Corporate Message

Connect hearts, shape the future

COMWARE New Declaration

A solution business partner that drives the NTT Group's comprehensive ICT business with software technologies to change you and the world

COMWARE Identity   https://www.nttcom.co.jp/english/about/identity/

See pg. 4 for more details on the roles of the COMWARE Identity and New COMWARE Declaration.

NTT COMWARE Group Sustainability Policy

We will address social issues and strive to meet public expectations as a company that reflects its highest aspirations, in complete alignment with COMWARE Identity. While engaging in fair business practices, we will periodically review the content and relative priority of our material issues and their respective categories, set goals with foresight and creativity, and demonstrate transparency in our disclosures.

Categories

Social Contribution with ICT | Safety and Security | Environment | Employees and Partners

Fair Business Practices

Materiality

Ten material issues were defined within the categories set out in the sustainability policy, which are Social Contribution with ICT, Safety and Security, Environment, and Employees and Partners, and also Fair Business Practices, which supports the others.
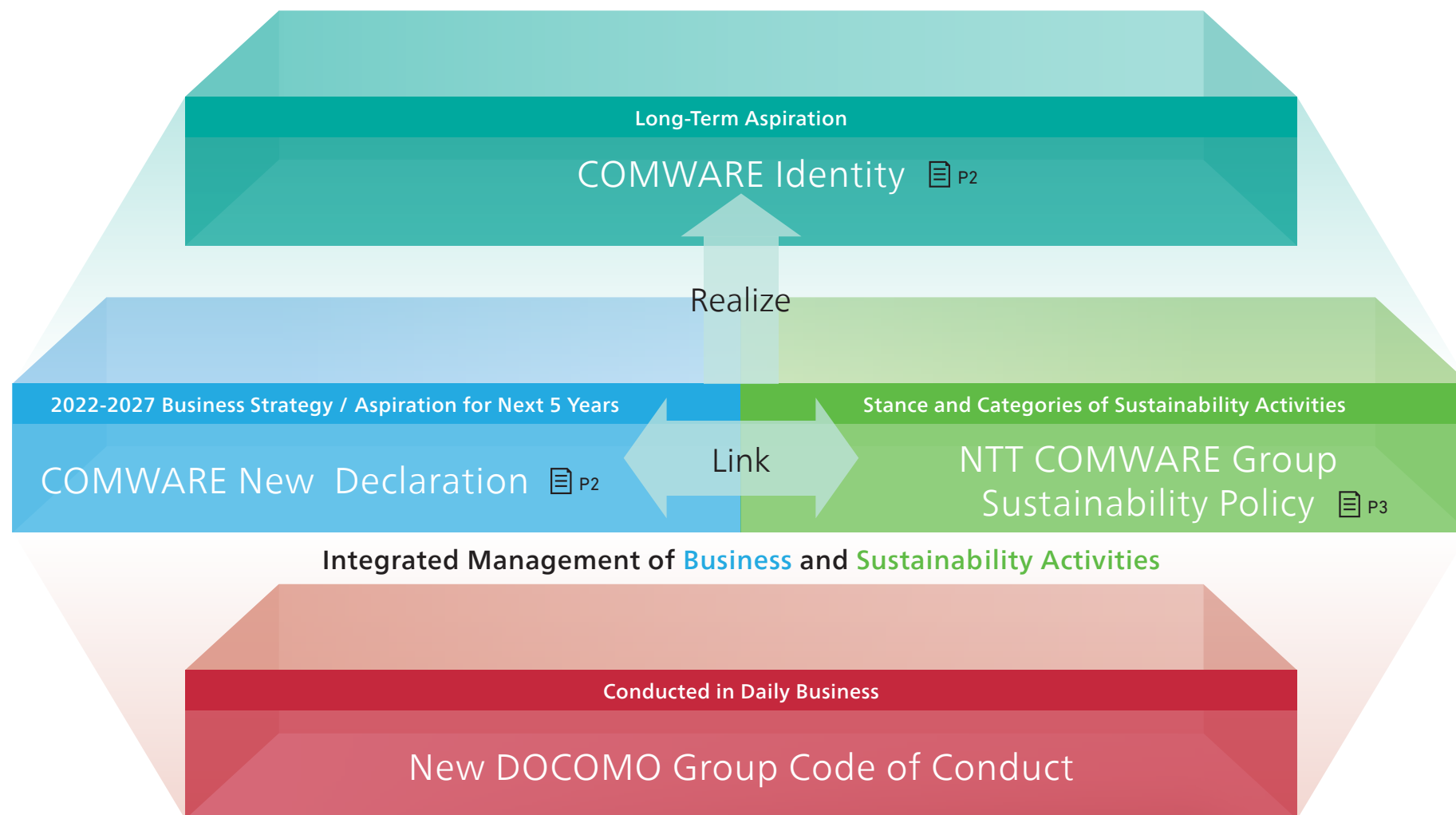
Category	Material Issues
Social Contribution with ICT	Social contribution with ICT
Safety and Security	Enhancing social infrastructure quality | Robust security environment
Environment	Carbon-free society | Circular economy and biodiversity
Employees and Partners	Diversity | Human resources development | Collaboration with business partners
Fair Business Practices	Human rights | Corporate ethics

Support for the UN's SDGs

The NTT COMWARE Group has promoted initiatives that contribute to the SDGs since fiscal 2016. In order to make an impact that draws on the characteristics of our business, while taking into account our sustainability strategy, we are planning and promoting initiatives through divisional collaboration while also incorporating the opinions of stakeholders.

Strategic Action through Collective Effort

We will seek to realize the COMWARE Identity over the long term by successfully carrying out over the medium-term business activities that generate economic value and sustainability activities for solving environmental and social issues.

Long-Term Aspiration

COMWARE Identity 📄 P2

Realize

2022-2027 Business Strategy / Aspiration for Next 5 Years

COMWARE New Declaration 📄 P2

Link

Stance and Categories of Sustainability Activities

NTT COMWARE Group Sustainability Policy 📄 P3

Integrated Management of Business and Sustainability Activities

Conducted in Daily Business

New DOCOMO Group Code of Conduct

*The New DOCOMO Group Code of Conduct sets forth three important actions for embodying the brand slogan of the new DOCOMO Group, "Changing worlds with you."

Sustainability Strategy Highlights

NTT COMWARE Accelerating Contribution to IOWN® Initiative

The IOWN® (Innovative Optical and Wireless Network) Initiative currently being promoted by the NTT Group seeks to realize a society where all infrastructure is controlled by ICT, to create systems for everyday living and the economy that enable all citizens to live safe and comfortable lives, and to accomplish this all in a sustainable form. The aim is to harness innovative technologies to go beyond the limitations of existing infrastructure and create a society with sophisticated optimization between the individual and the whole based on all available information. NTT COMWARE is accelerating its efforts to achieve the initiative's goals.

❶ **All-Photonics Network (APN)**

An initiative to deploy optical communications technologies at every level, from networks to inside terminals, in order to raise processing capacity and broadly control power consumption.

❷ **Digital Twin Computing (DTC)**

A new service application that creates a virtual real world in the digital world to make possible infrastructure simulations and forecasting with an even high level of precision.

❸ **Cognitive Foundation®**

A system that connects all the ICT resources in society and provides control of them to optimize their deployment and structure.

IOWN® Initiative　Three Elements for Realizing a Smart World
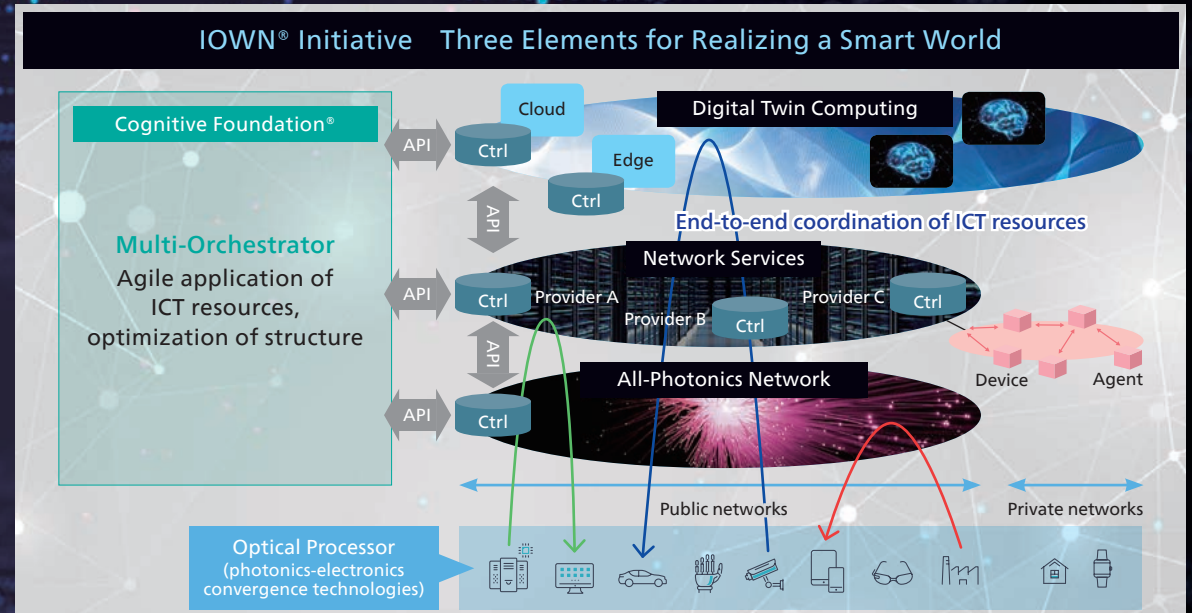
About the IOWN® Initiative

With the evolution of AI and IoT, the transformation of social infrastructure is accelerating. There is an increasing need to meet diverse requirements with greater accuracy and precision, while at the same time addressing the issues of electricity consumption for data processing that continues to increase and ever-expanding network traffic and electronic processing speeds reaching their limits.
The IOWN® Initiative seeks to transform existing information and communications systems and create the ICT platform of the future, going beyond the current limits of ICT technology to achieve a smarter society (the "Smart World"). The initiative has three main elements.

IOWN

For details on IOWN®, refer to the NTT R&D website at right: 🔗 https://www.rd.ntt/iown/

NTT COMWARE Accelerating Efforts

Since establishing the IOWN Business Promotion Office in July 2020, we strengthened the organization substantially and relaunched it as the IOWN Business Promotion Department in July 2022. Drawing on our know-how in system development and network construction and operations cultivated to date, we have commenced the development and utilization of core technologies and the development and promotion of business to realize a Smart World based on the IOWN® Initiative.

❶ Examples of APN activities Participation in a demonstration experiment for establishing "super white box" control technology
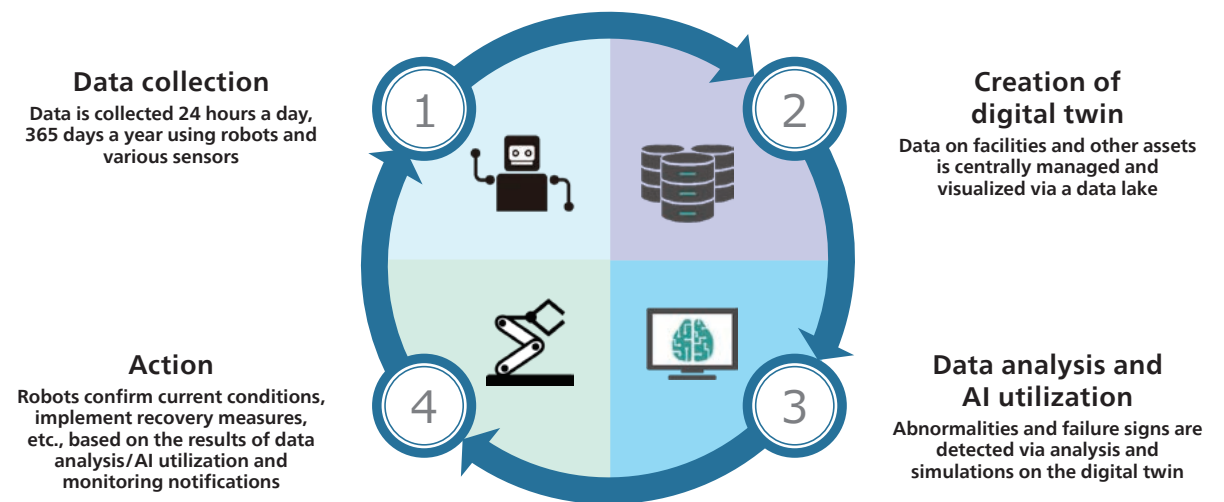
Currently ICT systems are configured by connecting together multiple types of hardware, specifically, servers, routers and switches, and storage. This hardware is filled with a large amount of wire and circuit boards that make up the electrical circuitry, and this restricts data processing speed and low-carbon performance. IOWN® is working to develop a "super white box " (SWB) by using optical communications for all of this hardware and flexibly combining resources like CPUs and memory through optical technology. Creating the SWB will greatly contribute to the APN's performance target of a 100-fold enhancement to energy efficiency .

NTT COMWARE is participating in a demonstration experiment for establishment of SWB control technology. In particular, as a specialist in network integration, we are conducting testing on SWB software control and planning a new operations system.

❷ Examples of DTC activities Demonstration experiment for labor saving in data center operations through use of robots and digital twin technology

With the continued evolution of robots and AI, efforts are being increasingly made to utilize robots at data centers. NTT COMWARE is working to develop a fully automated data center, which is an example of DTC utilization. Toward its realization, we began a demonstration experiment in March 2022 in collaboration with HBA Corporation.

Data center operations are monitored and recovery measures taken when failure is detected utilizing HBA's automated patrol robot, HBA Smart Robot, or HSR, and the collected data and operating status are compiled and analyzed on a digital twin like Smart Data Fusion®, NTT COMWARE's platform for data analysis and utilization. In this way, we are working to verify the entire lifecycle of operational automation at data centers.

Data collection
Data is collected 24 hours a day, 365 days a year using robots and various sensors

Creation of digital twin
Data on facilities and other assets is centrally managed and visualized via a data lake

Action
Robots confirm current conditions, implement recovery measures, etc., based on the results of data analysis/AI utilization and monitoring notifications

Data analysis and AI utilization
Abnormalities and failure signs are detected via analysis and simulations on the digital twin

SDG 2
ZERO HUNGER

Society's Expectations The amount of arable land on the Earth is limited. At the same time, as countries have developed, populations have increased and living standards have gone up, and, further, due to the impact of climate change as well, there are mounting concerns that in the near future food shortages will occur worldwide. SDG 2 calls on all the world's citizens to work to raise food supply capacity, promote effective use of food resources, and to collaborate in solving food-related problems.

The Challenge of Next-Generation, ICT-Based Agriculture

The NTT COMWARE Group develops and provides solutions that contribute to more efficient economic activities in a range of industries. Agriculture is one of our areas of focus, and drawing on our long-amassed store of knowledge in ICT and data analysis, we are developing demonstration projects in a number of regions together with specialists and farmers, taking on the challenge of realizing next-generation agriculture.

BLOFware®.Doctor for Efficiently Achieving High Yields and High Nutritional Value
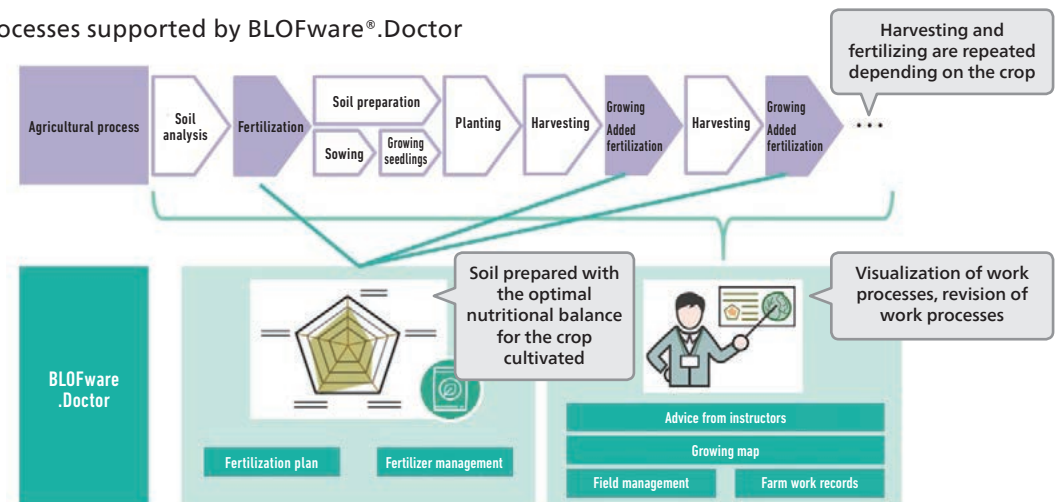
BLOFware®.Doctor is a farming support cloud service started in 2020 that was developed jointly by NTT COMWARE and Japan Bio Farm Co., Ltd. The service, which is provided to agricultural cooperatives, farming corporations, and individual farmers throughout the country, makes it possible to conduct organic farming in a simple manner based on the BLOF® theory* in which high-quality, highly nutritious and high-yield crops are produced scientifically and logically with a focus on soil preparation. Embedded with calculation logics for soil mineral balances and pH values for each crop, including rice, vegetables and fruit, the service provides detailed management and support on a cloud basis for each agricultural process.

NTT COMWARE will continue to expand agricultural support cloud services in the BLOFware® series for diverse agricultural products, enhancing, sophisticating and automating the menu of support options. Through these efforts, we will not only help address food-related problems but also promote the spread of agriculture with low environmental impact and in harmony with nature as typified by organic farming.

* An abbreviation of Bio Logical Farming theory. An organic farming technology that divides processes into three areas, amino acids, minerals, and soil, and conducts farming scientifically based on this to achieve high quality, high nutritional value, high yields, and stable production.

Agricultural processes supported by BLOFware®.Doctor

Agricultural process → Soil analysis → Fertilization → Soil preparation / Sowing / Growing seedlings → Planting → Harvesting → Growing / Added fertilization → Harvesting → Growing / Added fertilization → ...

Harvesting and fertilizing are repeated depending on the crop

BLOFware .Doctor

Soil prepared with the optimal nutritional balance for the crop cultivated

Visualization of work processes, revision of work processes

Fertilization plan | Fertilizer management

Advice from instructors
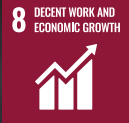Growing map
Field management | Farm work records

SDG 3
GOOD HEALTH AND WELL-BEING

Society's Expectations Building a society that enables everyone throughout the world to live a healthy life is the common desire of all humanity. Today though there are still innumerable issues we need to overcome related to health and welfare; there is an urgent need for many types of medical and healthcare services, including coping methods for hard-to-treat diseases. SDG 3 is a call for greater cooperation to solve these problems, and private-sector companies are among those strengthening partnerships with medical and research institutions.

Promoting Collaboration for Better Health

As an expert in ICT, AI and data science, the NTT COMWARE Group works to employ these technologies to solve problems facing society. In healthcare, we are applying the technologies to medical and welfare challenges in order to promote better health and foster innovative capacities.

Empirical Research on Using AI Technologies to Treat Diabetes

Diabetes affects many people around the world, and the search for appropriate treatments has gone on for decades. The decision on whether to prescribe insulin shots to patients is particularly difficult and requires very careful consideration. NTT COMWARE has collaborated with Niigata University's School of Medicine as a part of our partnership agreement with the university to utilize AI in the treatment of diabetes.

The team utilized medical record data to teach an AI system, through machine learning, the records of patients for whom specialist physicians chose to treat with insulin shots at the initial stage and then verified the decision-making ability of the AI system on whether the treatment was necessary at the initial stage, in part by comparing it to non-specialist physicians. The AI system was capable of judging the necessity of insulin treatment at a level equivalent to specialist physicians, showing that it could be used to support important decisions on treatment policies at hospitals and clinics. These findings were published in a medical journal and have drawn significant attention.

AI-based support for insulin treatment decisions

Patient vitals data

Medical record data

Creation of AI-based model for insulin treatment decisions

Information provided in support of insulin treatment decisions

SDG 8
DECENT WORK AND ECONOMIC GROWTH

Society's Expectations Creating environments where all people can healthily engage in meaningful work is essential to the building of a productive, vital society. This is why SDG 8 positions both decent work and achieving higher levels of productivity as important objectives. Its importance has increased still further during and after the pandemic, both in business and daily life, and expectations for innovation from ICT companies are increasing.
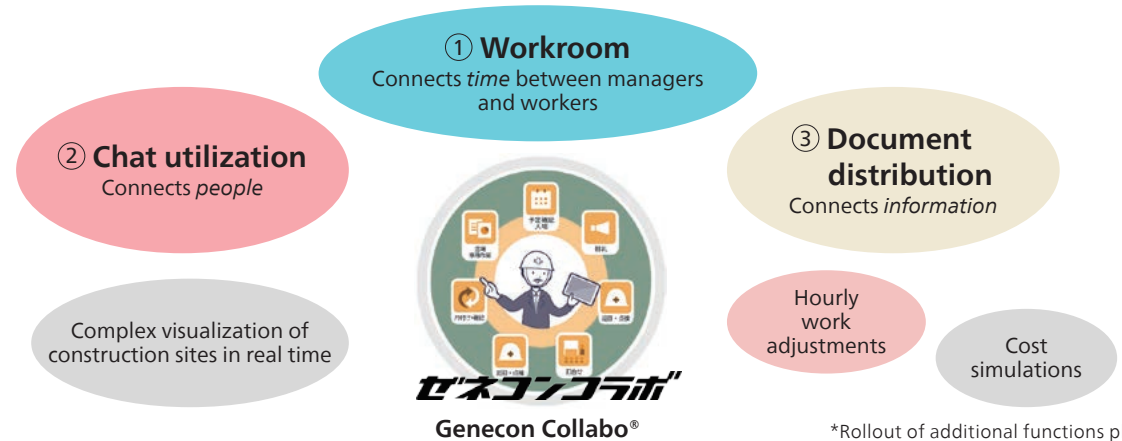
Digital Transformation for Worker Safety and Industry Efficiency

The NTT COMWARE Group has long worked to contribute to the transformation of economic activities through products and services that utilize ICT. As a part of this, we are focused on proposing DX for realizing onsite operations with high productivity that are safer, smoother, and more reliable. We are already developing and providing progressive solutions that can contribute to SDG 8.

Genecon Collabo® for Construction Industry Needs

The construction industry faces many issues on its frontlines, including, in recent years, the aging population, worker shortages, a multi-national workforce, and worker safety in light of climate change. There are high expectations for DX to help increase the efficiency of onsite processes and smooth the sharing of information. It is from this perspective that NTT COMWARE has developed and launched Genecon Collabo®.

This cloud service connects *people*, *information* and *time* related to construction sites using digital technology. Through various forms of collaboration, including use of a chat function to connect people, distribution of documents that bring together information, and a workroom function that automatically gathers reports from frontline workers, the time required to communicate and share information is shortened further and the process is smoothed.

DX Provided by Genecon Collabo®

Connects *people*, *information* and *time* related to **construction sites** using digital technology, and through various collaborations, **further shortens the time required to communicate and share information and smooths the process.**

① **Workroom**
Connects *time* between managers and workers

② **Chat utilization**
Connects *people*

③ **Document distribution**
Connects *information*

Complex visualization of construction sites in real time

Hourly work adjustments

Cost simulations

Genecon Collabo®

*Rollout of additional functions planned

SDG 9

INDUSTRY, INNOVATION AND INFRASTRUCTURE

Society's Expectations   SDG 9 calls for innovation to be promoted throughout society in order to realize a society where people can live progressive, comfortable lives now and in the future. ICT companies in particular are expected to take the initiative in contributing to this goal through development and practical application of advanced technologies that positively impact society and individual communities.

Contributing to Social Infrastructure Transformation through Active Utilization of ICT and Digital Technology

As NTT COMWARE Group states in the New NTT COMWARE Declaration, "Leading the overall ICT business of the NTT Group, we are a solutions business partner changing worlds with you," and in this regard we are accelerating our efforts. In particular, consolidating technologies cultivated in communication facility maintenance and management, data management, and data science, we are promoting efforts to bring about the transformation of various types of social infrastructure.
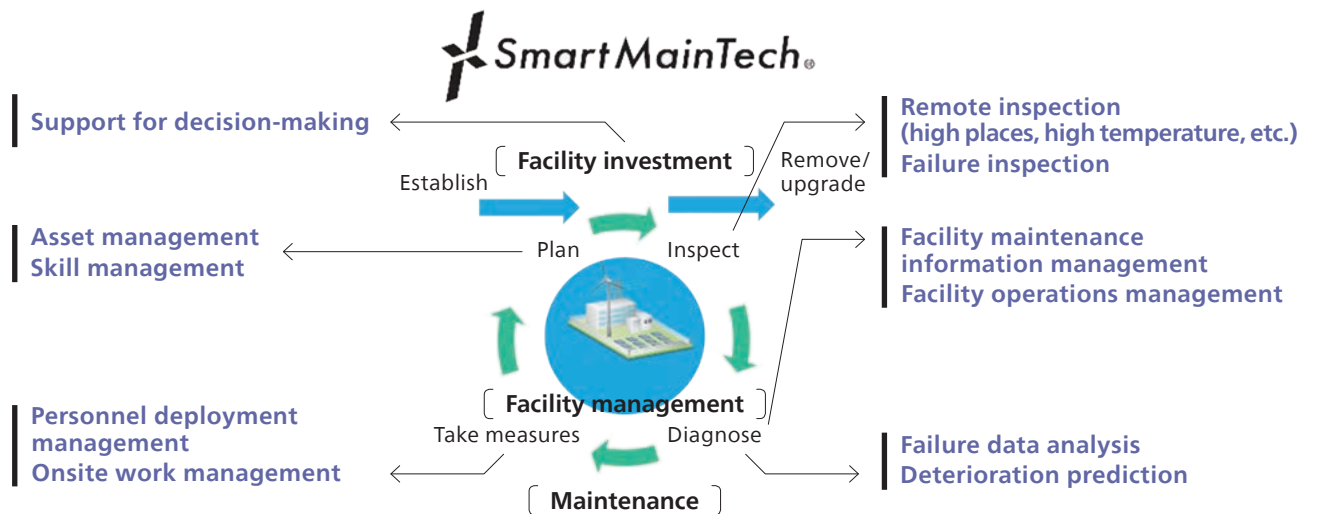
SmartMainTech® Helping to Increase the Sustainability of Social Infrastructure

SmartMainTech®, as the name suggests, is a DX service for infrastructure facility maintenance and operations that is part of the NTT Group's efforts to realize a Smart World. It is characterized by all-encompassing DX proposals aligned with the infrastructure lifecycle, from facility investment to operations and upgrading.

The service is comprised of Smart Data Fusion® for facilities management using a digital twin, Infratector® typeC, which is an AI-based construction inspector, and Field Collabo®, which provides integrated management of onsite management tasks. It is being used at construction sites in the communications industry, in power plant operations in the renewable energy industry, including solar and wind power, and for inspections and ensuring safety in the area of public infrastructure, including roads and rivers. In this way, the service is helping to increase the sustainability of social infrastructure.

SmartMainTech® for the infrastructure lifecycle

SmartMainTech®

- Support for decision-making
- **Facility investment** — Remove/upgrade
- Establish
- Plan — Inspect
- Asset management / Skill management
- Remote inspection (high places, high temperature, etc.) / Failure inspection
- Facility maintenance information management / Facility operations management
- **Facility management**
- Take measures — Diagnose
- Personnel deployment management / Onsite work management
- **Maintenance**
- Failure data analysis / Deterioration prediction

SDG 11
SUSTAINABLE CITIES AND COMMUNITIES

Society's Expectations SDG 11 emphasizes building sustainable, resilient infrastructure throughout society in order to ensure people can live safely and comfortably. There are many social issues that still need to be addressed, and social expectations continue to increase for the development of innovations that can help make improvements, as well as for rendering these innovations as services.

Contributing to Lively Local Community Development with Further Application of ICT/AI to Infrastructure

ICT has deeply penetrated everyday life and economic activity. Efforts to utilize its power to develop progressive, lively communities are underway in regions around Japan. The NTT COMWARE Group, in collaboration with NTT Group companies, proposes mechanisms that contribute to regional revitalization through the sophisticated use of ICT and AI in order to promote the revitalization of the economic base in individual regions.

Active Application of LIKEUP UX Engine with NTT Group Companies

LIKEUP UX Engine, developed proprietarily by NTT COMWARE, grasps the real-time scenes and situations of users and their diverse, constantly changing values to propose the experiences users want in real time and make proposals for future scenes and stories as well.

FUN COMPASS®, a mobile tourism navigation system developed jointly with NTT Communications using LIKEUP UX Engine technology, provides information for the optimal travel experience, tourism DX that promotes longer stays by tourists and enhances the motivation to make purchases. A demonstration project using a mobile navigation system with FUN COMPASS® for the purpose of stimulating the tourism industry was conducted in Okinawa Prefecture in July 2022 and successfully enhanced tourist excursions.

Through the fusion of UX Engine with the services of NTT Group companies, we will work to create new value in health, beauty, and other areas and contribute to solving social issues in everyday living.

Managing Value for Smart World

LIKEUP

UXエンジン

Enhanced Travel with Personalized Suggestions
This service provides information not only on popular destinations where visits tend to be concentrated but also on local spots known to those in the know, communicating the appeal of the entire region. This not only enhances the quality of the excursions of individual tourists, but it also contributes to regional revitalization.

Problems Become Opportunities for Discovery
Even when the person's schedule suddenly changes due to bad weather or other unforeseen happenings, optimal spots are suggested based on a consideration of real-time conditions, including the person's present location and the current time. Opportunities are thereby created to discover parts of Okinawa that the person may not have been aware of.

Discover New Local Charms
A wide variety of suggestions are made, from the latest hot spots to traditional culture, making possible a travel experience perfectly in line with each person's values. Tourists experience the region's diverse appeal, which increases repeat visitors returning multiple times.

An Expanding Scope of Action—For Readers Who Want to Know More

The NTT COMWARE Group contributes to the SDGs through many initiatives beyond those introduced thus far.

8 DECENT WORK AND ECONOMIC GROWTH

Redefining the Value of the Office

SDG 8: DECENT WORK AND ECONOMIC GROWTH

Redefining the value provided by offices as, specifically, real communication and providing an environment conducive to work, we are developing offices that provide mechanisms to facilitate interaction and new work styles.

The office is divided into a number of distinct areas, a collaboration area, an area for online conferencing, a concentration area, and, for a place to relax, a café area. Workers are able to choose the area that suits their situation at any given time.

We will conduct various verifications, and, based on the know-how obtained, we will pursue greater job satisfaction and work productivity as well as floor optimization for the entire company.

4 QUALITY EDUCATION

Data Science Lectures for the Next Generation of Talent

SDG 4: QUALITY EDUCATION

Based on a partnership agreement with Niigata University, we have provided data science-related classes at the university since fiscal 2019. A lecture by an NTT COMWARE employee held in June 2022 drew the participation of around 100 students in the university's master's degree programs. Though held online like last year, participants were active in asking questions on lectures related to data science history, current business needs, and various methods, which contributed to their thinking on their future research and career paths.

7 AFFORDABLE AND CLEAN ENERGY

Accelerating Use of Green Power

SDG 7: AFFORDABLE AND CLEAN ENERGY

Guided by the goal of realizing carbon neutrality by fiscal 2040, one of the targets put forth by NTT Green Innovation toward 2040, the new environment and energy vision of the NTT Group, NTT COMWARE is doing its part by ramping up decarbonization of its business on a full-fledged basis. Having begun using renewable electricity in fiscal 2020, for fiscal 2021, we set a target of using at least 20 million kWh, and we successfully surpassed the target, using 28 million kWh for the year.

Refer to the following sites for more details on voluntary contributions connected to our sustainability strategy, as well as on our efforts to contribute with customers through our products and services.

NTT COMWARE

Sustainability Site
Provides information on the NTT COMWARE Group's sustainability activities, including ongoing initiatives in line with our vision and strategy.

🔗 https://www.nttcom.co.jp/csr/
(Japanese site)

Service Profile Site
Introduces our many products and services for realizing a better society with customers and end-users.

🔗 https://www.nttcom.co.jp/solution/
(Japanese site)

Inquiries