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01 Node-AI × Data Analysis × Problem-Solving

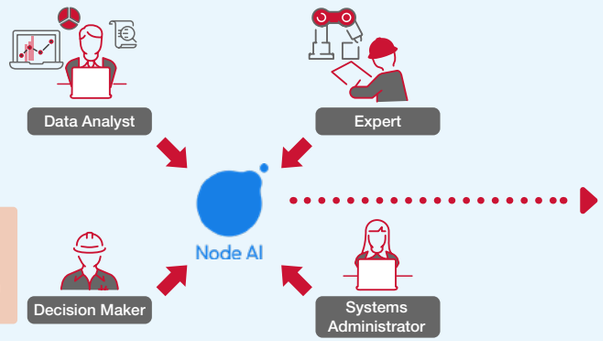
Accelerated Problem-Solving through Social Implementation of Node AI

Social Issue

AI Projects Face Many Challenges

With the accelerating deployment of AI across society, concerns over transparency and risk management are driving the need for the implementation of responsible AI, which is expected to be used is diverse fields, from marketing and business efficiency improvement to the handing down of technologies as well as predictive analysis. Its deployment, however, requires specialized knowledge and skills, and AI projects involving numerous stakeholders tend to be complex and complicated. Moreover, there is a long way to go before we can turn the finished AI model into a system and verify the results and risks, while training and securing AI human resources are also challenges. A lot of hurdles must therefore be overcome before AI can be widely implemented to solve social problems.

[Creating AI Models with Node AI]



- More efficient analysis
- Data check
- Analysis flow sharing
- Discussion function on the tool

Using AI to design an analytic flow

Solution

Solution for Streamlining AI Projects

Node AI is a no-code AI development tool developed by NTT Communications to streamline AI projects through collaboration. It allows the user to design an analytic flow by freely connecting cards on a browser and to easily create and execute a series of pipelines from pre-processing time-series data to learning and evaluating AI models.

Since AI analysis using Node AI is specialized for time-series data and can be useful for prediction, anomaly detection, causal analysis, and factor analysis, it is expected to be applied across a variety of industries and business fields. Project members will be able to access all information from a data analysis at any time, and the tool also facilitates discussions and the creation of reports. By visualizing the basis for AI decisions using patented technology, members can also freely discuss the process as needed and without creating a so-called “black box.” As a result, communication costs will be reduced while improving the overall efficiency of an AI project. AI models developed using Node AI can be easily linked through APIs with our proprietary tools, and models can be retrained with the provision of additional data.

While Node AI is essentially a development tool designed for the user, it also provides hands-on technical and usage support by data scientists as needed. We plan to implement an AI assistant as Node AI becomes increasingly user-friendly. Additionally, we will be able to quickly develop, apply, and continuously improve AI models through Node AI.

Our Vision of Society

Toward a Future Where Everyone Uses AI

Myriad companies have recently been exploring the use of AI to solve various problems but have had limited success due to a shortage of AI human resources and expertise, which has been frustrating for me as an AI researcher. Under the circumstances, we decided to develop Node AI, with the hope of realizing a world where the users can take advantage of AI to solve those different problems. Until now, NTT Communications has been providing AI solutions by acting as an analyst to address issues faced by customers. For AI to become more accessible in society, tools such as Node AI will be required as a means of enabling anyone to create AI models with minimal preparation. We will continue to refine Node AI as a solution, including support for developing human resources skilled in AI to assist in addressing all sorts of social concerns.

Keisuke Kiritoshi
Product Manager
Technology, Innovation Center

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02 Call Center × Interactive AI × Labor-Saving

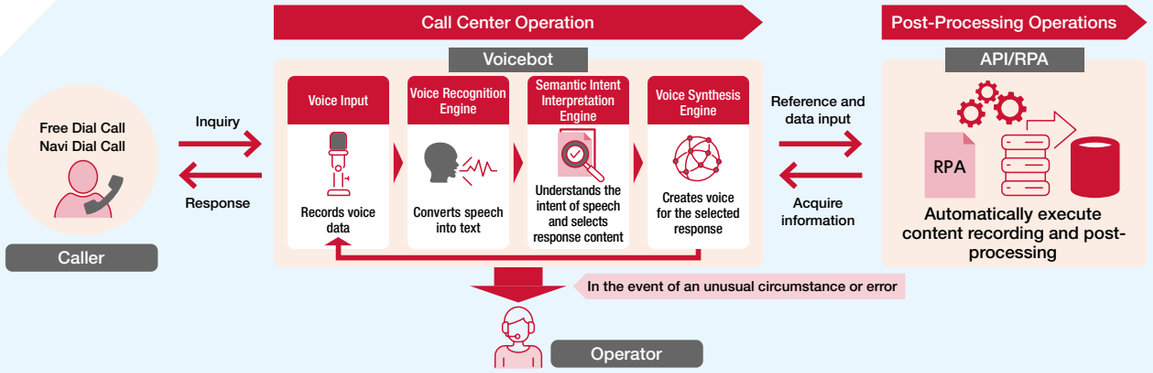
Call Center Response Using Interactive AI

Social Issue

Difficulty in Training and Securing Human Resources

Call centers that serve as the face of a company at the front line of customer service have recently been suffering from a chronically tight availability of operators and staffing shortage. Call center operations generally require several months of training, as there is much to learn about the products and the services offered. Due to the difficulty in securing and training human resources, there are cases where operators are assigned to do work without having received sufficient training in that area. In addition, call volume varies between busy and off-peak hours, which complicates the assignment of appropriate personnel. Poor call-handling can lead to lower customer satisfaction and lost opportunities, making it an issue that companies must address as soon as possible.

[Overview of COTOHA Voice DX® Premium]



Solution

Voicebot for Optimizing Call Center Operations

NTT Communications has been developing COTOHA Voice DX® Premium, a voicebot solution that uses AI to handle telephone calls at call centers and company contact points since 2019. The solution, an AI-enabled automated voice response system that handles everything from answering calls to subsequent processing, is capable of automated response 24 hours a day, 365 days a year, thus preventing opportunity loss while reducing work hours of personnel, by automating the entire process from receiving inquiries to writing them into the system. The number of channels can be flexibly changed according to variations in seasonal and peak hour demand, preventing customers from feeling uncomfortable or anxious when calls are disconnected. Call center operations can be optimized by utilizing the voicebot for routine tasks and operations with a high volume of incoming calls and allocating vacant operator capacity to tasks that require more advanced responses. The solution has already been implemented in a wide range of industries and operations, including finance, infrastructure, telecommunications, and retail. When it is introduced, we not only combine and provide the best AI engine for each project of the company or organization as a solution but also conduct thorough preparations such as a proof of concept before implementation. Even after introduction, it is possible to individually repeat AI learning and tuning for greater accuracy and come closer to the optimal solution.

Our Vision of Society

Solutions that Can Be Used in Various Fields and Situations

Compared to text-based chatbots and web forms, the voicebot has the advantage of being more easily accepted by customers who prefer to be answered by phone, because the voicebot responds with a natural sounding voice through a speech synthesis engine. Voice recognition accuracy will further improve and is expected to increase customer satisfaction as well as the operational efficiency of call centers by offering responses that are even smoother and more accurate. Going forward, we are looking into adding new services, such as identifying individuals using voiceprint identification technology, and we believe that the value of the voicebot as a solution will continue to grow. As voicebots have only recently been introduced worldwide, lots of people likely have yet to use one. We will develop voicebots as a solution that can be used in a wider variety of fields and situations to establish them as an indispensable, familiar presence around the globe.

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03

Labor-Saving × Smart Farming × Biodiversity

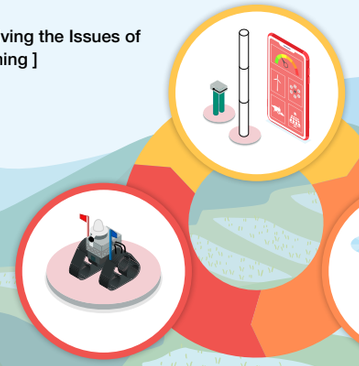
Striving for Sustainable Terraced Paddy Field Farming that Is Friendly to Both People and Animals

Social Issue

Shortage of Rice Farmers in Japan

In mountainous Japan, rice cultivation in terraced rice fields on sloping terrain has been handed down from generation to generation. The shortage of rice farmers has long been a social concern due to the declining birthrate and aging population, and this trend has become more pronounced in mountainous regions and islands where it is difficult to secure large areas of farmland. For example, Sado City in Niigata Prefecture has been promoting rice cultivation with reduced use of pesticides in order to coexist with the Japanese crested ibis, a special natural treasure, and was recognized as Japan's first Globally Important Agricultural Heritage Systems (GIAHS) in 2011. However, the impact of the farmer shortage is steadily creeping into this beautiful remote island, and the city is trying to find a way forward by introducing smart agriculture using robots, AI, IoT, and other technologies.

[The Path to Resolving the Issues of Rice Terrace Farming]



Advanced Water Management System

By linking the Tamon® automatic water valve device with the MIHARAS® IoT sensor, water supply status can be remotely monitored, which is expected to automate and save labor in water management.

Drone

Drones are used for aerial photography and surveying terraced rice fields to create 3D models of the fields. Analysis of the data enables prior determination of the optimal machine to be selected, such as a radio-controlled mower that can even travel along slopes and therefore significantly reduce labor.

Paddy Weeding Robot

Equipped with image recognition AI and remote monitoring functions, this robot is particularly effective in the labor-intensive work of weeding paddy fields.

Solution

Agricultural ICT Solutions Shared in the Community

NTT Communications is participating in the World Agricultural Heritage and Toki no Shima (Sado) Smart Agriculture Consortium, which is focused on establishing a sustainable farming method for terraced rice fields that is friendly to both people and living creatures in Sado City, Niigata Prefecture. Ensuring that Sado can remain a habitat-friendly environment for crested ibises will require pesticide-reduced, pesticide-free, and chemical-free cultivation in the terraced rice fields that are shape the original landscape of the island. Sado has strived to build a local brand and increase profits by, for example, establishing a program called Creating a Township Where People Can Live with Crested Ibises for certifying safe and tasty Sado rice. Maintaining agricultural practices that do not rely on pesticides in the terraced rice paddies spread out on mountain slopes requires a level of manual labor that is too heavy for elderly people, such as managing rice banks and cutting grass. As part of the above consortium, NTT Communications participated in a pilot project to introduce agricultural ICT solutions such as drones, paddy field weeding robots, and advanced water management systems to terraced rice fields. The two-year project has been underway in cooperation with government agencies and local agricultural corporations since fiscal 2022 and has been selected as part of the FY2022 Smart Agriculture Production Area Model Demonstration by the Ministry of Agriculture, Forestry and Fisheries. Its purpose is to determine the value of agricultural ICT solutions that significantly contribute to automation and labor-saving in agricultural work while exploring the possibility of sharing the cost and benefits of these new interventions with the local community. We are also examining business models that take into account environmental conservation and yield maintenance, as well as the improvement of the sales price of rice by certifying pesticide-free and chemical-free cultivation. We will continue to our research, development, and practice of smart agriculture, starting with Sado Island, to address the issues of terraced rice field farmers nationwide.

Certification mark for Creating a Township Where People Can Live with Crested Ibises

Our Vision of Society

Working with Local Communities to Revitalize Japanese Agriculture

[Usui] We will help revitalize agriculture by involving students and other next-generation leaders, deepening our engagement in Sado and other regions and working with local communities to refine our agricultural ICT solutions.

[Yumoto] Given the remaining technical issues with ICT solutions such as weeding robots, we will continue our efforts to help solve local problems by mobilizing the cooperation and wisdom of numerous people.

[Hatano] We believe that smart agriculture can create new value to address the aging of farmers and the shortage of successors. We will therefore accumulate and analyze data to expand the possibilities of agricultural businesses.

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Manager
Assistant Section Chief
Niigata Branch,
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Shunsuke Hatano
Niigata Branch,
DOCOMO Business Solutions, Inc.

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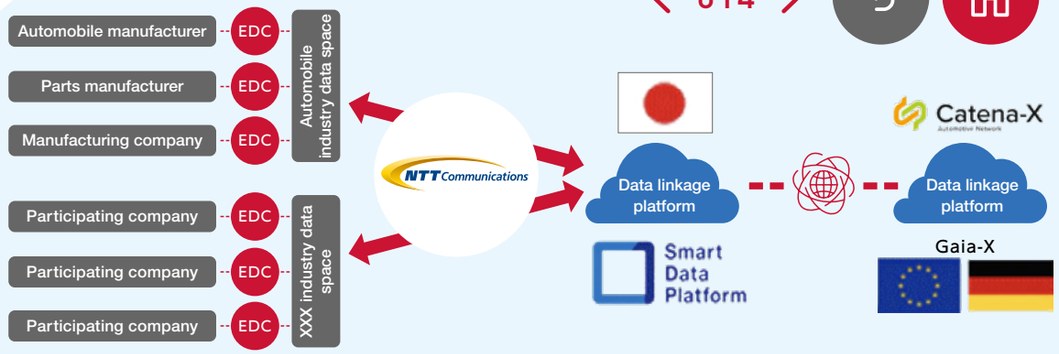
Inter-Company Data Integration × Decarbonization × Resource Recycling

Social Issue

Digital Transformation of the International Community to Achieve the SDGs for Social Issues

Concerns over the monopolistic operation of personal and corporate data by giant IT companies led to the launch of the Gaia-X concept in Europe in 2019 as a data linkage platform and public infrastructure. As a first step, the Catena-X data exchange network between automotive companies began operating in the fall of 2023. This alliance focuses on the safe and fair inter-company data linkage of environmental data based on European standards, to reduce CO_2 emissions throughout the value chain and the circular economy in response to the global trend toward decarbonization. On the other hand, companies in Japan have insufficient mechanisms for aggregating data such as carbon footprints by product, and the legal system and data platform also lag behind, which may reduce international competitiveness and the corporate value of those companies from the perspective of ESG management.

[Connection to Various Data Spaces in the EU]



Solution

Supporting the Introduction and Use of a Data Linkage Platform between Companies

In light of the companies in Japan, mainly European subsidiaries, that are forced to take immediate action to disclose product-specific carbon footprint data and resource recycling data in compliance with new laws and regulations, NTT Communications has begun working with partner companies to establish a solution that supports the use of data linkage platforms such as Catena-X. We will provide total support, from preliminary consulting to actual connection and operation, including the generation of highly reliable data and the connection of internal systems with data linkage platforms, with specifications tailored for each company. To interconnect with Catena-X, it is essential to support EDC, software for authenticating and controlling communications between companies, and a standard data model. NTT Communications provides a platform that combines EDC with data management and security functions, and it supports the setup and operation of the platform to establish an environment for the safe and secure exchange of data with business partners using data space. The rules, standards, and methods of Gaia-X and Catena-X will be taken over by a new project, Manufacturing-X, which encompasses the entire manufacturing industry and may emerge as the new data communication standard in various industries. So that Japanese companies can easily, safely, and inexpensively take advantage of the latest communication technology, NTT Communications will promote the development of authentication and data linkage platforms in Japan that protect data sovereignty as a prerequisite for exchanging secure data between companies. Starting with the Catena-X, it will promote inter-company data sharing that helps to achieve the SDGs and its use throughout the international community while also developing next-generation network solutions for achieving carbon neutral society and addressing various social concerns.

Our Vision of Society

Looking toward Decarbonization and Resource Recycling

[Sakaino] In achieving decarbonization and resource recycling, it's necessary to accurately grasp the volumes of CO_2 and waste emitted from economic activities, disclose and share that information based on common global rules, and encourage reductions. To those ends, we join efforts that mobilize the power of industry, government, academia, and the public across the boundaries between companies and national borders, and we contribute to the diffusion of a digital communications infrastructure that enables the reliable and safe use of data.

[Kato] First, we will apply our initiatives related to Catena-X, which focus on environmental issues, as a foothold for demonstrating the value of globally connecting diverse business groups and industries and working together to protect the Earth.

[Niizuma] Going forward, it will be necessary not only to follow the lead of Europe but also to build a collaborative platform in Japan based on a concept similar to Catena-X. We will create an environment in which data infrastructure can be utilized from a comprehensive perspective, helping to bring happiness to a lot of people.

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Akihisa Kato
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Smart World Business
Business Solution Division

Hideaki Niitsuma
Manager
Smart Industry
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05 Submarine Cable × Data Communication × Safety and Security

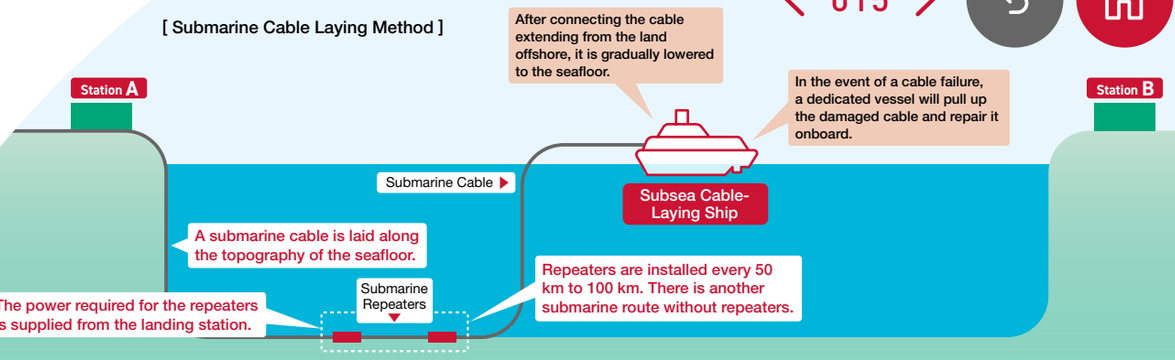
Submarine Cables Connecting the World to the Future

Social Issue

Growing Importance as a Communications Infrastructure

Submarine cables bundling optical fibers are responsible for 99% of international data communications such as the Internet and international telephone calls. Submarine cables can provide high-capacity, high-speed communications far exceeding satellite communications and now stretch across the world's oceans, with a total length of approximately 1.4 million km. The demand for data communications will clearly continue to increase worldwide, and plans are underway to strengthen submarine cables and lay new cables to meet demand. On the other hand, broken submarine cables can disrupt data communications, so managing the maintenance of existing cables is becoming increasingly important from the perspective of economic security, such as ensuring communications in the event of an emergency.

[Submarine Cable Laying Method]



Solution

Promoting the Submarine Cable Business that Continues to Connect the World

NTT World Engineering Marine Corporation is a marine engineering company responsible for the installation and maintenance of submarine cables. Since its establishment in 1998, the company has installed 9,000 km of domestic submarine cables and nearly 30,000 km of international submarine cables, and it is responsible for the maintenance of all submarine cables owned by the NTT Group.

With the recent rapid increase in data communications worldwide, demand for new submarine cable installation and maintenance, including repair work, has been rising as well. NTT World Engineering Marine operates four dedicated vessels such as for cable-laying and is engaged in a wide range of businesses, from design and marine surveys to cable laying and burial, repair work, and disaster response. Currently, it is mainly engaged in laying cables between the mainland and remote islands in Japan as well as the remote islands of the Philippines. The installation of new cables in areas is an important social issue, not only in terms of closing the information gap but also for the preparation for large-scale disasters.

Maintenance management of submarine cables is a key task for supporting infrastructure indispensable to society. Although the service life of cables is approximately 25 years, regular inspections are essential in sensitive areas because the cables can be replaced due to deterioration over time or damaged by fishing nets or ship anchors, in addition to damage from typhoons and other factors.

Even as Wi-Fi, 5G, and eventually next-generation wireless communications arise, the role of cables running along the ocean floor will remain constant, playing an unsung role in the world's data communications. NTT World Engineering Marine will continue to connect the world through submarine cables to contribute to building a sustainable society.

Our Vision of Society

Passing on Technology that Supports Data Communications to the Next Generation

Our submarine cable business is unique even within the NTT Group and can be viewed as a highly specialized venture. The main activities take place in the ocean, and unique knowledge and expertise are required to promote business, such as setting landing sites for submarine cables, designing installation routes based on an understanding of the seafloor topography, and negotiating installation and maintenance with fishing industry associations. In recent years, the social and economic importance of the submarine cable business has become even greater, although concerns have emerged over securing and training human resources and passing on the technology. We will widely promote the social significance and value of the submarine cable business, which connects the world and supports industrial development, as well as the satisfaction of our work. We will also support safe and secure communication infrastructure while looking to the future with a sense of mission and pride.

Taishi Marushima
General Manager
Corporate Planning Department
NTT World Engineering Marine Corporation
(NTT WE MARINE)