Digital Transformation for Accelerating Value Creation

Sojitz's Value Creation and Digital Transformation Initiatives

Creation of a Prosperous and Sustainable Future through Digital Technologies

Tomomi Arakawa

Managing Executive Officer
CDO (Chief Digital Officer), CIO (Chief Information Officer)
COO, Digital Department

After joining IBM Japan, Ltd., as a system engineer, Tomomi Arakawa became a director at this company in 2014 before being appointed as its first CDO in 2015. Arakawa assumed the role of executive officer and CDO at Sojitz in December 2021 and took up her current position in April 2023, and she has since continued to lead the Group's digital transformation and other digital technology strategies.

Concerted Effort to Accelerate Transformation and Value Creation through Digital Transformation

When I became CDO at Sojitz in 2021, "digital transformation" was still only a buzzword in Japan, and there were not really that many companies actually promoting digital transformation. Simply stated, digital transformation is the process of using digital technologies to transform a company. In this era of companies clambering toward digital transformation, Sojitz sought to take a head-on approach in digital transformation as a general trading company. Its first step: employee awareness reforms. There is no magic approach toward completing digital transformation. The potential for digital transformation is unlimited, and this is why it is crucial to first understand what digital technologies are, what it means to introduce these technologies into a business, and how these technologies can be used to create new value. Moreover, employees must recognize that these technologies can be used by anyone in any business. That is why I emphasize employee awareness reforms. For this purpose, we began developing training programs designed to grant all employees an understanding of digital technologies and help them realize their role in utilizing these technologies. The Company also launched a number of hands-on digital projects, which I oversaw directly as CDO, to allow employees to experience the potential of digital technologies firsthand. In this manner, we sought to introduce digital technologies into Sojitz's business while working together with employees.

Over the two years since I became CDO, Sojitz has taken an ongoing and extensive approach toward cultivating digitally proficient employees, whom we refer to as "DX-Experts." Business divisions have managed to cultivate their own DX-Experts, allowing them to spearhead their own digital technology projects. Digital technologies have thus taken root through Sojitz, and knowledge of these technologies are becoming a standard tool for Sojitz employees. Finally, standing at the starting line, Sojitz is poised to accelerate the creation of value by using digital technologies on a Companywide basis in order to transform itself into a next-generation trading company. Sojitz is a general trading company that has potential to greatly transform society given the scale of its business and the diversity of its portfolio. It brings me great joy when I see the benefits of digital transformation appearing in the form of results at specific workplaces.

I am committed to maintaining an up-to-date understanding of ever-evolving digital technologies so that I can use these technologies to promote digital transformation in pursuit of further growth at Sojitz. I hope you will look forward to Sojitz's future of accelerated progress toward growth using digital technologies.

Position of Digital Transformation in Sojitz's Value Creation Process

Over the years, general trading companies have continued to transform their business and asset portfolios as they sought to quickly respond to market needs and social issues. Sojitz, however, seeks to move beyond this traditional approach to transform itself into a next-generation trading company. For this reason, we are taking an all-in approach toward digital transformation strategies while placing particular emphasis on the following two key initiatives.

The first initiative is to create new value by implementing and utilizing digital technologies. This will entail installing digital technologies in existing businesses to generate opportunities for co-creation as well as developing new businesses to create new value using digital technologies. Implementing and utilizing digital technologies in the wide range of businesses Sojitz develops as a general trading company will require that the ideal technologies be selected based on an accurate understanding of the characteristics and industry conventions of each individual business. As CDO, I work closely with the heads of business divisions, using regular meetings as an opportunity to discuss the potential for implementing digital technologies in Sojitz's businesses from the perspectives of both the businesses and technologies to advance Companywide digital technology projects. The second initiative is the cultivation of DX-Experts who can be the proponents behind creating new business value. At Sojitz, we developed our own in-house curriculum to foster employees who are able to utilize digital technologies and promote co-creation in a manner suited to the business model of a general trading company.

As DX-Experts gain practical experience in their respective organizations, their teams and organizations obtain a valuable asset in the form of accumulated digital technology utilization expertise. Moreover, the cross-organizational sharing of this expertise has begun accelerating the use of data and digital technologies.

The march of technological progress is constant. We are therefore constantly reviewing our DX-Expert training programs to ensure that they are matched to the needs of the market and that the DX-Experts they produce are capable of contributing to the competitiveness of Sojitz. We will continue to create new value through a concerted, Companywide approach toward embracing digital technologies with eyes to the day when such technologies are a standard part of business and the title "DX-Expert" ceases to hold meaning.

Digital Transformation Promotion System

At Sojitz, the president himself chairs the DX Promotion Committee, and this committee is used to facilitate swift decision-making when it comes to digital transformation. The heads of business and functional divisions raise the issues they need to address in their respective business models or work processes with the DX Promotion Committee. The committee then engages in interactive discussion about the digital technologies that could address these issues and how these technologies could be employed. Having senior management at the forefront lends extra momentum to our efforts. Seeking to support this momentum from the perspective of digital technologies, Sojitz established the CDO Office when I was appointed CDO. Furthermore, in my new capacity as CDO and CIO, I oversaw the integration of the CDO Office, the IT Operation Department, and the ERP Transition Office to form Digital Department 1 and Digital Department 2 effective April 1, 2023. By consolidating our digital technology-related functions and staff in a single organization, we aim to improve the speed and quality of our efforts to promote digital transformation and to develop, maintain, and redevelop IT and infrastructure systems. I am also working closely with the CISO (Chief Information Security Officer), the highest authority for information security, to help strengthen information security as we accelerate the use of digital technologies.

Discussion on Digital Transformation and Digital Technology Utilization at Intensive Discussion Session for Management

In the 2023 intensive discussion session, a management retreat that saw participation from outside directors and other members of upper management as well as the heads of business and functional divisions, the implementation of digital technologies was defined as an important topic of discussion. This topic was discussed in a concentrated manner through a workshop on how to incorporate digital technologies into business activities. These discussions served to align all members of management, from the workplace representative level up to senior management, based on shared consensus on how to create new value using digital technologies.

Major Topics of Discussion

- Creation of new projects using digital technologies in business and functional divisions
- Strategies and measures for utilizing digital transformation as a source of competitiveness

TOPICS

DX銘柄2023 Digital Transformation

First Time Inclusion in Digital Transformation Stock Selection

In 2023, Sojitz was selected for inclusion, for the first time, in the Digital Transformation Stock Selection program organized by the Ministry of Economy, Trade and Industry, the Tokyo Stock Exchange, and the Information-technology Promotion Agency, Japan. In this program, the organizations select companies, from among those listed on the Tokyo Stock Exchange, that have developed internal frameworks for promoting digital transformation in a manner that contributes to improved corporate value and that are producing results through excellence in utilizing digital technologies. Sojitz's inclusion in this selection was a reflection of the high evaluation of its Companywide digital transformation initiatives and their results. These initiatives are advanced through an approach integrating digital transformation promotion system development with our management vision and business strategies. Going forward, Sojitz will continue to move forward with its all-in approach toward digital technologies in all of its businesses.

Digital Transformation Case Study

Smart Fishery Project at Sojitz Tuna Farm Takashima

Video Reference

Digital Twin Approach for Reproducing Aquaculture Cages in a Digital Space

Sojitz is accelerating the utilization of data and digital technologies in existing businesses in order to improve value and create new value. A prime example of these efforts can be seen in the smart fishery project that was carried out at Sojitz Tuna Farm Takashima Co., Ltd., where Sojitz is engaged in an industry–academia collaboration project with the Japan Agency for Marine–Earth Science and Technology (JAMSTEC).

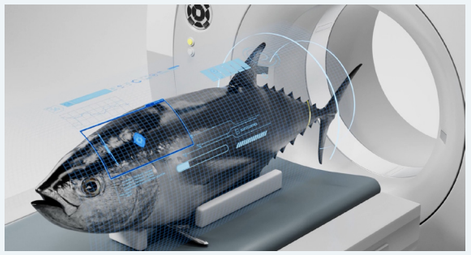
Digital Transformation Achieved through Co-Creation

Sojitz Tuna Farm Takashima is a bluefin tuna farming company established in 2008. Its farming site, located in the sea off of Takashima Island in Matsuura City, Nagasaki Prefecture, houses some 40,000 bluefin tuna at any given time. In the past, the amounts of feed and the ways this feed was administered were determined based on the experience and intuitions of the captains of feeding vessels and the divers who perform maintenance on aquaculture cages. However, this process could not be completely accurate as it was impossible to accurately count the number of tuna swimming in the aquaculture cages. The smart fishery project uses a digital twin* approach to address this inability to count the number of tuna by reproducing the aquaculture cages, in their entirety, in a digital space. This approach makes it possible to combine a virtual aquaculture cage, created based on information on the actual aquaculture cage and the tuna swimming therein, with a tuna swimming simulation to estimate the number of tuna of a certain size.

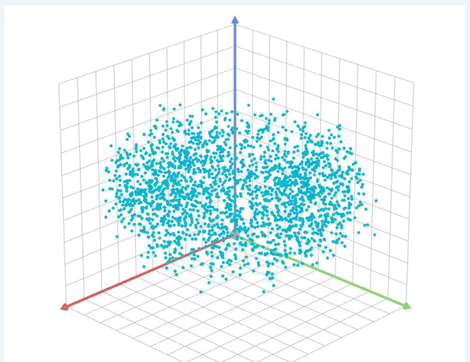
Applying the insight gained through basic research advanced together with JAMSTEC to create a virtual aquaculture cage requires massive quantities of tuna swimming image data to be analyzed, analog inputs to be converted into digital data, and this information to be reflected in the virtual aquaculture cage model. Sojitz has been directly involved in all steps of this process, spanning from the acquisition of image data to the measurements and estimates on the number of tuna. We first prepared a virtual aquaculture cage for use in reproducing the swimming patterns of the tuna, and then used the data gained from the simulation prepared using the virtual aquaculture cages as the teaching data for the final simulation system. Sojitz personnel were then dispatched to the site directing divers to dive into the aquaculture cages and set-up cameras produced in-house, carefully adjusting camera angles to collect the data necessary for video systems and image processing. In addition, fish detection systems and CT scanners were employed to input 6,000 images into a machine learning system in order to produce the virtual aquaculture cage model. Through this ongoing process of AI training, we succeeded in developing a system that could estimate the number of tuna in the aquaculture cages with the initially targeted level of 95% accuracy.

When we first began the project, it was expected that it would require around two years to produce the virtual aquaculture cages. However, the expert advice and proactive support of JAMSTEC and other co-creation partners allowed for swift progress in all steps of the process, resulting in the successful completion of the virtual aquaculture cage model in just six months.

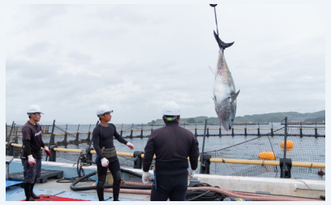
* Technology that consists of a digital counterpart of a physical object or process. Objects or processes being studied are outfitted with various sensors for tracking vital data



CT scanner used to determine characteristics of sonar system for detecting tuna



Simulation of tuna swimming in virtual aquaculture cage (screenshot)



Conventional Bluefin Tuna Farming		Digital Twin Approach
• Inability to count tuna at desired timing (limit to counting tuna only a few times a year when moving between aquaculture cages) • Feed costs representing more than half of total costs	Need to accurately track number of tuna	**Accurate tracking of tuna numbers made possible by producing virtual aquaculture cages** • Reduction of waste through calculation of efficient feed amounts • Ability to identify ideal shipment timing

Growing Scope of Digital Technology Application

Sojitz employees were involved in all steps of the smart fishery project, actually performing the necessary programming, a process that allowed us to acquire expertise and insight that will be invaluable to future projects entailing the use of digital technologies. In addition, we are currently in the process of developing an automated feeding support system that optimizes the amounts of feed issued based on the state of the tuna in the aquaculture cages.

The digital twin model that was the cornerstone of this project is a technology that can be used to address a wide variety of issues. Accordingly, applying this technology to other businesses has the potential to contribute to the resolution of issues and the creation of new value. Sojitz has developed a marine food product value chain that comprises The Marine Foods Corporation, TRY Inc., and Dalian Global Food Corporation, as well as Sojitz Tuna Farm Takashima, the company involved in the smart fishery project. Sojitz is committed to improving profitability across the entirety of its marine food product business.

Going forward, we will continue to utilize digital technologies in co-creative projects to create business value in pursuit of the sustainable use and reliable supply of marine food products.

Hiroyuki Onishi (left), president of Sojitz Tuna Farm Takashima, and Emina Ryuo (right) of Digital Department 1, who was responsible for inputting data into virtual aquaculture cage model

CDO and CIO Tomomi Arakawa explaining project to institutional investors and analysts visiting Sojitz Tuna Farm Takashima in Nagasaki Prefecture

Digital Transformation for Accelerating Value Creation

Cultivation of DX-Experts

Training Programs Tailored to the Multifaceted Business of a Trading Company

Progress in Cultivating DX-Experts

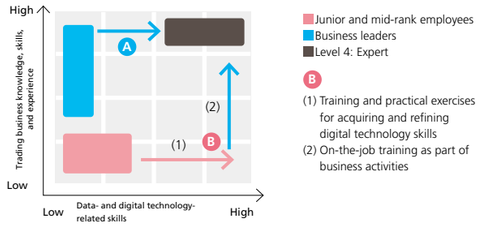
Sojitz's DX-Expert training programs define five skill levels. For the entry-level course, which targets all employees, and the basic-level course, which is for all career track employees, around 90% of applicable employees have completed training. The practical application-level skill courses are divided into the two skill categories of data analysis and business design.

The expert-level data analysis course is designed to foster individuals capable of utilizing big data through coding to propose and implement solutions to business issues through machine learning and other technologies. Participants are thereby empowered to play a central role in promoting data-driven measures for addressing the issues faced in their respective organizations. For example, the skills granted by this course could be used to analyze marketing and other data to propose sales measures for specific products or to combine text data mining* and machine learning technologies to track and analyze business processes based on text documents.

Two routes have been defined for business design courses: Route A for leaders with substantial trading business experience and Route B for digital native (junior and mid-rank) employees seeking to acquire and refine specialized digital technology skills as part of building their career through business activities. In Route A, program participants are exposed to a myriad of successful digital transformation case studies so that they can practice adapting the essence of these case studies to match the business model of their respective organizations in order to improve and create value. Route B is meant to foster individuals capable of properly reaching a consensus and engaging in co-creation with internal and external digital technology partners in relation to development of their desired digital services, technological bottlenecks, and other matters. One exercise toward accomplishing this goal is training in the development of online applications using coding. Meanwhile, as part of our efforts to recruit new graduates, we arrange digital transformation internships consisting of multiple-day workshops with the aim of recruiting students who possess sophisticated digital technology skills.

* Text data mining: Analysis method of identifying trends and connections in collected data

Two Routes of Business Design Courses



DX-Expert Training Programs and Participation Targets

Skill Level		Skill Categories: Data Analysis	Skill Categories: Business Design	Participation Target under Medium-Term Management Plan 2023 (Progress as of August 31, 2023)
Practical Application	Level 5: Thought Leader	Guidance and oversight of experts as a leader to promote the transformation of organizations and businesses with digital technologies		—
	Level 4: Expert	Data analysis for verifying hypotheses to plan and propose resolutions to business issues	Skills for creating new businesses and improving value of existing businesses through use of digital technologies	40 employees (73%)
	Level 3: Experienced	Understanding of basic data analysis methodologies for use in hypothesis verification regarding analysis challenges	Understanding of basic programming principles that can be used to assist in application prototyping, development, and verification	300 employees (69%)
Level 2: Basic		Basic knowledge for applying digital technologies to business activities (IT literacy, information security, data science, digital marketing)		All career-track employees (89%)
Level 1: Entry		Entry-level knowledge required of all employees that deal with IT (National IT Passport certification, low-code tools)		All employees (90%)

Shunsuke Miyawaki
Manager, Digital Data Analytics Section,
Digital Department 1

Message from Project Leader Involved in DX-Expert Development Program Planning and Implementation

As a general trading company, Sojitz is involved in a wide variety of business areas. This is why it is important for employees to acquire a balanced array of various digital technology skills and to be able to engage in co-creation with internal and external partners. We realized that the pre-packaged training programs available to be purchased were insufficient for cultivating the type of employees Sojitz needed for its digital transformation strategies. This is why we decided to craft a unique program custom-tailored to Sojitz's unique needs. We went about this through a repeated process of examining the expected roles of digital technology staff based on a collective understanding of their skills and backgrounds. We devoted particular effort to the development of the expert-level training programs to ensure that they could endow participants with a high degree of practical skills. Frontline issues and data utilization were major points of focus of these programs. A flexible approach is taken toward incorporating input from program participants as we seek to cultivate employees who are able to utilize data analysis as a tool in their respective businesses. Going forward, we will continue our efforts to build the foundations for utilizing digital technologies and to foster DX-Experts who can contribute to actual business activities to accelerate the growth of the Company with the goal of contributing to improvements to Sojitz's corporate value.

Comments from Participants in Expert-Level Data Analysis Course

Hiroto Tabara
Section 2,
Automotive Department 1
Automotive Division

Current Analysis Challenges Optimization of product mix and improvement of profitability through business area analyses based on purchase data

Ambition as a Beginner

There are a lot of opportunities to analyze data as part of the business activities of the Automotive Division. Fortunately, the Company is proactive in encouraging us to acquire IT skills. I am involved in domestic and overseas automotive dealership and used car sales businesses, but I have not previously had the opportunity to learn about programming. Participation in the expert-level data analysis course helped me gain an understanding of a wide range of ways to interpret data and raised my awareness regarding the need to choose the appropriate methods of collecting and approaching data. My newfound knowledge also made me realize that we were just sitting on a lot of valuable data that was ripe for using. I later went on to learn programming languages outside of Python, which was taught in the course. This understanding has made it easier to come to a consensus when working with internal and external partners in projects for addressing issues or pursuing improvements using digital technologies. Going forward, I will continue to use non-electronic communication methods when digital methods are insufficient, as I act as a trading professional to resolve frontline issues with data and bridge the gap between business activities and digital technology projects.

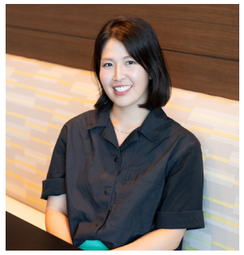
Masataka Sukita
Asset Management Business Section,
Retail Business Department 3
Retail & Consumer Service Division

Current Analysis Challenges Formulation and proposal of revenue improvement measures for consumer products based on clustering analyses*

Growth of Individuals and Growth of Organizations

I feel that there is a lot of room for people with marketing and data analysis skills to contribute in the focus area of retail defined by Medium-Term Management Plan 2023. Based on this realization, I decided to take part in the expert-level data analysis course as I felt that it presented the opportunity for me to take advantage of my background in real estate and shopping center management. Today, I am going beyond the bounds of my organization to get involved in the data utilization projects of other divisions by making proposals based on the unique perspective founded on my own personal insight and experience. Data analysis is an ongoing process of hypothesis verification. What makes data analysis interesting is how the same data can lead to different interpretations and hypotheses depending on who looks at it, meaning that this is an area where our individuality comes into play. I also feel that project teams have increasingly been embracing the idea of moving away from the discussions grounded on experience and perceptions that used to be commonplace to found discussions on information reflecting reality and tracking such information. If this emphasis on hard facts can become an entrenched custom among my colleagues and at other organizations, I think it will contribute to the development of a mindset and workplace atmosphere that encourages autonomous contributions and action toward resolving issues by those who are actually affected by said issues.

* A statistical method for processing data and organizing items into groups or clusters on the basis of how closely associated they are



Misato Yamamoto
Planning & Administration Section,
Planning & Administration Office
Aerospace & Transportation
Project Division

Current Analysis Challenges Development of task grouping models by applying text data mining and machine learning technologies to email text

Immersion Skills and Creation of Opportunities to Use Skills

I decided to take part in the expert-level data analysis course after returning from childcare leave based on my search for opportunities to utilize the code skills I had developed in university in my career as a trading professional. Learning Python through this course really opened up new horizons for me in regard to digital transformation. I am now capable of using data to discuss our approach toward matters that would previously have been decided based on the experience of employees with longer tenures. I can even act as somewhat of an "interpreter" for communicating the language of data to other parties. It is incredibly important for analyses to be conducted as a team. By engaging in discussions based on a common understanding with clear goals, it is possible to advance a variety of approaches toward big data over a short period of time. Also, Sojitz has internal communities for digital technology experts. Through these communities, we share analysis case studies and knowledge, and new ideas are always being proposed. These communities thus serve as a constant source of stimulation. In the future, I look forward to applying interpretation and approaches based on analyses of collected data to the resolution of business issues while providing advice on exactly how this insight can be utilized.

Digital Transformation for Accelerating Value Creation

Digital Transformation Case Studies

Used Car Distribution Platform

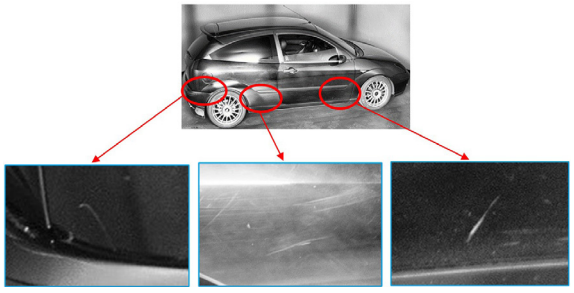
Every used car is unique. For this reason, information on the condition of individual vehicles and their repair and accident histories is imperative to used car transactions. However, there have been issues regarding a lack of transparency in such information. Seeking to address this issue, Sojitz invested in Twinner GmbH of Germany. Twinner offers a service known as Twinner Space, which uses high-resolution scanning technologies to create high-quality digital twins of vehicles. These digital twins faithfully recreate the internal and external condition of a vehicle, including any scratches or dents, in the form of digital data that can be viewed from a variety of angles. The resulting ability to clearly assess the condition of a vehicle contributes to increased transparency in transactions.

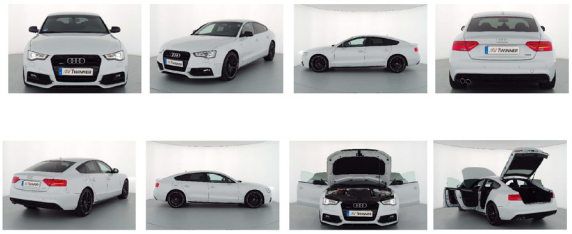
The first Twinner Space venue in Japan has been set up in Kiyosu City, Aichi Prefecture. Certificates guaranteeing the quality of digital twins are displayed at Aperta Nagoya, a Sojitz-operated used import luxury automobile dealership located next to the venue, granting customers an additional degree of peace of mind. As Twinner Space allows for the condition of vehicles to be confirmed anywhere by viewing digital twins saved on a cloud server via the internet, it has potential to function as a solution for creating a new used car distribution platform, which would deliver new customer experiences together with improved convenience.

Sojitz looks to contribute to the digital transformation of used car distribution through such initiatives.

Aperta Nagoya used import luxury automobile dealership

Twinner Space vehicle scanner


Vehicle damage detection by scratch sensor


Vehicle scan data that can be viewed from 360 degrees through Twinner Space

Digitalization of Coal Mine Operations in Australia

Sojitz's Gregory Crinum coal mine in Australia produces coking coal for steel product applications, and we are incorporating digital technologies into the process of operating this mine. Specifically, mine operation data and equipment remote control technologies are being employed to improve operational efficiency with the goal of optimizing coal production costs. Going forward, Sojitz will continue to utilize various data and multifaceted analyses to make data-driven management decisions and to optimize the maintenance of the equipment that is so crucial to mining operations through a preventive maintenance approach.

Moreover, mine rehabilitation measures (restoration of natural environment and greening of stripped land) are being advanced at Gregory Crinum with the goal of making the mine more eco-friendly. Through this process, Sojitz is accumulating expertise and digital technologies (3D simulation technologies). We aim to combine these assets in the future to create unique digital mine rehabilitation services that can be applied to other mines in order to help resolve social issues related to mines.

Remote control of mining equipment


Dragline excavator used for stripping mine sites