

### Co-creating with domestic and international partners to realize a sustainable future

Our goal is to take ideas from our Research & Recommendations all the way through to real-world implementation, a feat that is only possible by working together as a group and with business partners.

We have identified three material issues for

creating and maximizing social value, which is the greatest driver for resolving societal issues. We have a host of initiatives in Japan and overseas aligned with our three material issues.





# Human Resources

## We develop and deliver a range of services that use original technology to eliminate the skills mismatch

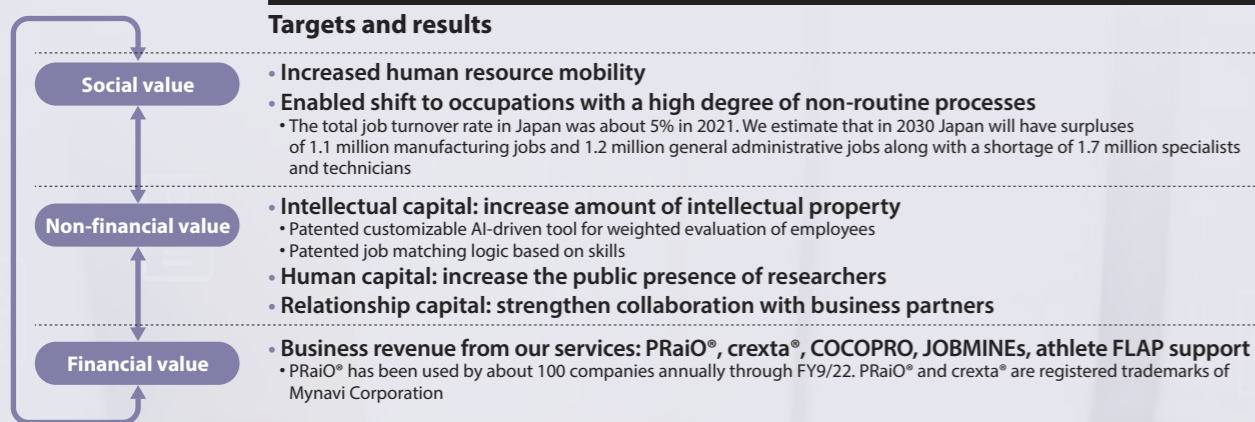
Japan is on the way to becoming a society with about half of its former population, which could result in an even worse shortage of human resources. In addition, globalization and digital transformation are changing the industrial structure, which in turn is changing the capabilities that companies need in their workers and creating a skills mismatch.

At the same time, as 100-year life spans become more commonplace, we must create a society where everyone can play an active role and maintain their personal well-being.

We offer a range of solutions to erase the skills mismatch by overhauling human resource development and the labor-employment environment to align the jobs that people want with the skills that companies need.



Hiroyuki Ueda  
VCP Manager, Human Resources



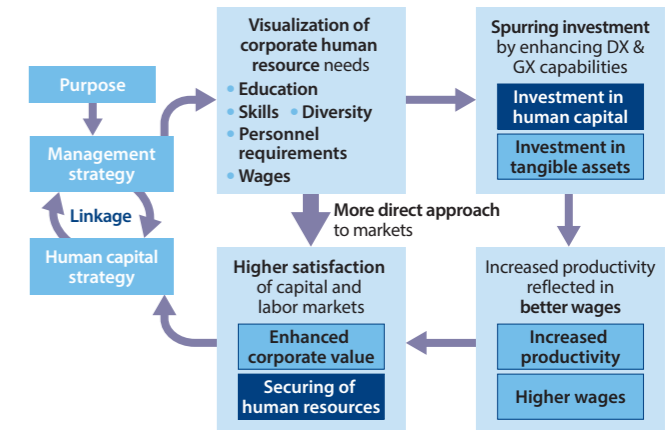
## The Human Capital Management Consortium

In human capital management, companies view, and aim to maximize the value of, human resources as capital—thus corporate value grows over the long term. The Ministry of Economy, Trade and Industry commissioned us in 2022 to run the Human Capital Management Consortium, a platform for sharing progressive examples, discussing intercompany cooperation, and exploring effective disclosure.

As a member, we work to raise awareness of human capital management and promote behavior change in companies, the capital market, and the labor market.

We strive to forge a positive cycle in which human resources choose companies that actively invest in their workforces as a key element to achieving further growth. We will continue to show how management and HR strategies are linked and promote behavioral change in markets.

### Positive cycle centered on visualization of human capital

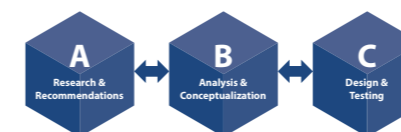


## Changing the relationship between companies and people by guiding clients through human capital management

I joined the company because I wanted to be involved in employment and labor policy and have participated in several research projects on workstyle reform and how the way we work is changing. The consortium brings together people from various backgrounds to combine their expertise for the implementation of human capital management. It's a hugely interesting topic, but it also comes with great responsibility. As a researcher, it's very rewarding to work with companies, investors, and government agencies on projects that will transform the relationship between companies and people.



Mana Ohashi  
Policy and Strategy Group,  
Career Innovation Division,  
Business Consulting Unit



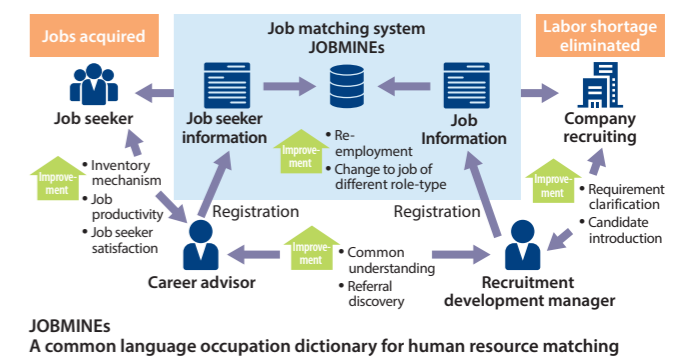
## Human resource matching system based on job tasks

We aim to match human resources with company needs and eliminate the skills mismatch by introducing our FLAP Cycle® to society. FLAP is an acronym for Find, Learn, Act, and Perform. It is a full cycle in which individuals understand their skills and specific job requirements (Find), acquire skills needed (Learn), progress in their desired direction (Act), and take an active role on a new stage (Perform).

In October 2021, we launched the JOBMINEs job matching system for HR companies as one application of the FLAP Cycle®. It provides an occupation dictionary of about 1,000 jobs and 20,000 tasks. Companies and workers refer to this common dictionary, with companies honing in on the items that fulfill their job requirements and individuals honing in on the items that make use of

their experience and skills. The system is also useful for job seekers to find ways to reskill and upskill.

### The JOBMINEs system and its benefits





# Urban Life and Mobility

## We craft original services that create new opportunities for activity and new demand

The challenges that cities are facing are becoming deeper, more complicated, and interlinked. The worldwide covid pandemic greatly restricted our opportunities for activity, while in Japan the aging and declining population has laid bare issues like how to maintain the level of public services amid dwindling demand and public finances. These issues can no longer be resolved by governments and companies alone; citizens will need to consider what is best for their wellbeing and for the sustainability of their region, take action, and subsequently make these solutions a reality by developing relationships with their communities.

Mitsubishi Research Institute will envision how society and individuals can achieve their wellbeing while taking an integrated approach to addressing the various issues faced by specific regions. We are currently bringing our Region Ring® digital platform to regions around Japan—a platform that facilitates a wide range of actions by individuals, governments, companies, and local communities.

We are also developing and implementing regional digital-transformation services to generate new demand. These incorporate advanced digital technologies such as big data analysis, the internet of things (IoT), and artificial intelligence (AI).



Hirotaka Higuchi  
VCP Manager, Urban Life and Mobility

Targets and results	
<b>Social value</b>	<ul style="list-style-type: none"> <li>• <b>Establishment of mutual sphere</b> Example: The Daimaruyu SDGs ACT 5 demonstration project in Tokyo's central office district aimed at popularizing and increasing awareness of SDGs activities</li> <li>• <b>Increasing activity outside the home in line with local needs</b></li> </ul>
<b>Non-financial value</b>	<ul style="list-style-type: none"> <li>• <b>Human capital: fortified public presence of researchers</b></li> <li>• <b>Intellectual capital: increased intellectual property</b> Example: Patented depreciation function for Region Ring®</li> <li>• <b>Relationship capital: strengthen collaboration with business partners</b></li> </ul>
<b>Financial value</b>	<ul style="list-style-type: none"> <li>• <b>Primary service income</b> Example: Seven projects using Region Ring® in 2020–2022</li> </ul>



## Actfulness: our original concept for improving wellbeing

People need to participate in activities that are mentally stimulating and enriching to fully enjoy their lives. We propose that *actfulness*, abundant and diverse opportunities for activity, improves wellbeing.

Actfulness means increasing the choices, the overall amount, and the quality of activities. If companies and public institutions can incorporate the concept into

providing urban functions and transportation services, a wider variety of services will be created that meet activity needs and generate new demand. In turn, companies and communities will enjoy enhanced value.

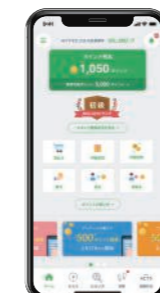
We will continue to work with a wide range of companies and local governments to integrate actfulness into local communities.



## Region Ring®: our digital regional currency platform to resolve societal issues

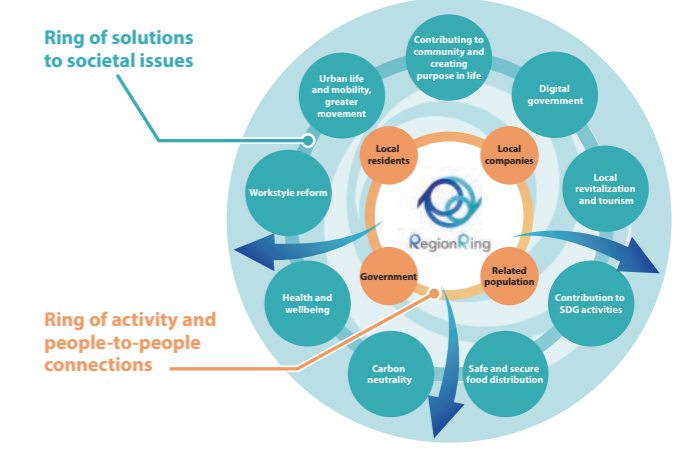
We work with business partners to develop and implement innovative solutions to societal issues. Our Region Ring® digital regional currency platform, for example, provides a point system that converts activities like volunteering and environmental work, such as waste reduction and energy conservation, into economic value. We are already implementing Region Ring® across the nation. Such services will help resolve local societal issues by encouraging behavior that is beneficial to individuals and society. In FY9/21, the Region Ring® application helped motivate

people to engage in some 30,000 new SDG actions and raised awareness of the SDGs by 10%.



**ACT 5 member-based point app promoting SDG action**  
We provided a point-reward application for smartphones using the Region Ring® technology during the Daimaruyu SDGs ACT 5 project held from May to November 2022 in Tokyo's central office district of Otemachi, Marunouchi, and Yurakucho. The app was a trial service that linked purchases to action on the SDGs.

**Region Ring® Platform**  
A prosperous and sustainable world in an era with a global population of 10 billion and lifespans of 100 years



## Lessons learned from running an application and system as a business in house

The Region Ring® project, of which I am the business manager, involves many employees working on numerous tasks in the application planning, development, and operation of the app before it is actually used by the public.

I have a huge responsibility to coordinate stakeholders, oversee design, and manage changes, and there are times when highly complicated problems need immediate answers. At the same time, I also have many opportunities to interact with end users, which gives me a real sense of how the project is making its way into society. It's also very rewarding to see the enthusiasm of our project members, such as how they come together to overcome difficulties.



Yuji Ozeki  
Regional DX Business Group,  
Regional Innovation Division,  
Business Consulting Unit



# Global Business

## We help resolve societal issues around the world flagshipged by our Vietnam and UAE offices in Asia and the Middle East

We are engaging our in-house experts in a wide range of fields and collaborating with partners in Japan and overseas to simultaneously address societal issues and create new industries in regions around the world. Our focus is on Asia and the Middle East—the former has vast growth potential and many Japanese companies are setting up operations there; the latter is making concerted efforts to realize a decarbonized society.

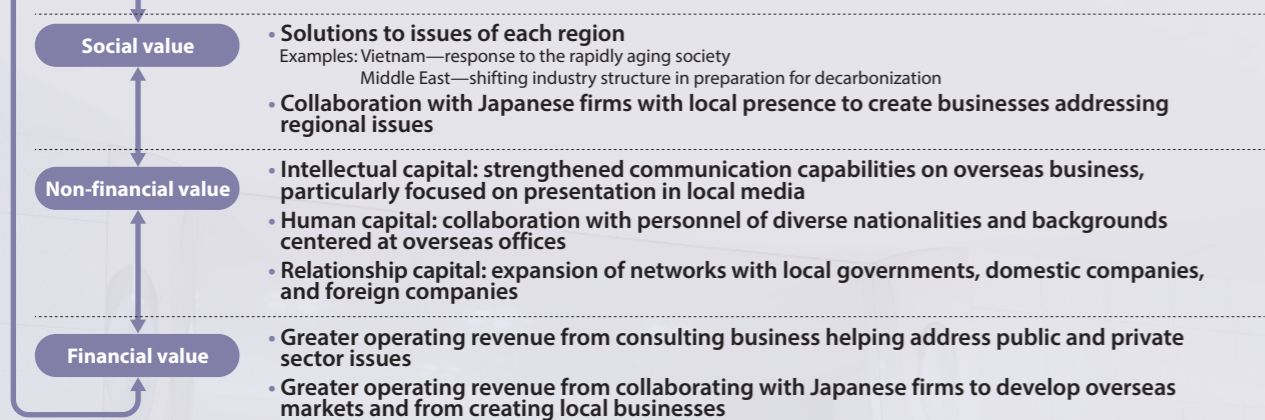
We are expanding our networks in both regions from our offices in Hanoi, Vietnam, and in Dubai, United Arab Emirates (UAE), both of which began full-scale operations in FY9/21. Each office is providing policy-planning support and business consulting services suited to each region's specific issues.

In FY9/22, we conducted healthcare initiatives in Vietnam, made policy recommendations for waste treatment and recycling in Saudi Arabia, and presented at an international climate change conference in Qatar.



Yufuko Takashima  
General Manager, Global Business Division

### Targets and results



Workshop in Saudi Arabia on waste management and recycling hosted by the Embassy of Japan in December 2021 introducing Japanese waste treatment technology and expertise to government and industry representatives



## Measures for Vietnam's aging population

The Vietnamese population is aging at one of the fastest rates in Asia and is expected to become an aged society even earlier than Japan\*. The government is responding by implementing various programs, such as developing a health support application for older adults, but at present the more effective care services are only attainable by the wealthy.

We provide support for the government's initiatives by sharing measures and experience from Japan, such as the comprehensive community care system and the long-term care insurance system, through opportunities for communication such as presenting at government-sponsored seminars. In April 2022, we conducted a survey in Hung Yen Province on the issues faced by older adults, and in August 2022, we signed on to a partnership with the United Nations Population Fund (UNFPA) Vietnam in the study and promotion of a society that supports older persons. We also began a consulting service to support the launch of businesses

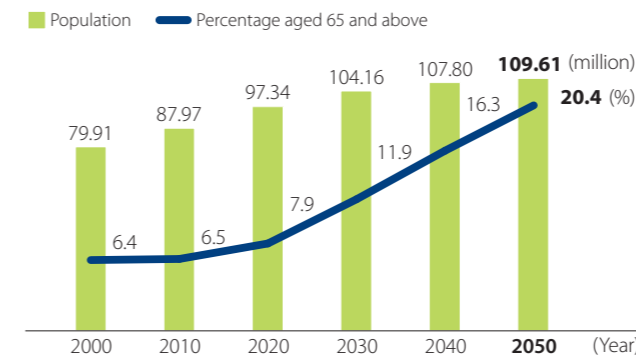
for older adults by care providers and real-estate developers. We will continue helping to design programs and create industries that will expand aged-care services in Vietnam.

\* When the number of people aged 65 or higher is between 14% and 21% of the total population



Interviewing older adults in Hung Yen Province with local government and the Ministry of Health of Vietnam (April 2022)

### Vietnam demographics and percentage of people aged 65 and above



Source: Mitsubishi Research Institute based on The World Bank *World Development Indicators* (1/12/2021)  
<https://databank.worldbank.org/source/world-development-indicators>



Signing the memorandum of cooperation with UNFPA Vietnam to study and promote a society that supports older persons (August 2022)

## Creating business opportunities that align with a future Asia

The 21st century is said to be the age of Asia, and while growth is expected, the number of societal issues is also increasing. We are working on measures to address the aging population in Vietnam. Japan can make a significant contribution in this area, but we need to work with various stakeholders and find solutions that are catered to Vietnam's specific circumstances and socio-economic trends. This is a challenging task, but I will continue looking to the future to create business opportunities that will have a positive impact.



Mitsuhiro Ito  
Asia Business Group,  
Global Business Division



# Energy

## We run a gamut of measures to help Japan become carbon neutral

The consequences of global warming are becoming progressively pronounced with measurably rising sea levels, weakening ecosystems, and increasingly frequent natural disasters. The Sixth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) concluded in 2021 that there is “no doubt” that human activity is warming the climate system. It is becoming clear that creating a carbon-neutral society in Japan and worldwide will be critical to limiting the potentially devastating effects of global warming.

We are responding by promoting renewable energy as a main power source by working to create an environment where distributed energy resources (DER) can be used to their full potential. Some of the ways we are doing this are by developing systems to ensure sound operation over the medium to long term, improving the accuracy of prediction technology for wholesale electricity prices and power generation capacity, and making the most effective use of storage batteries and electric vehicles. We are also pursuing innovation to develop new technologies and the safe use of nuclear power as a stable source of non-fossil fuel energy.



Hiroyuki Sasada  
VCP Manager, Energy

**Targets and results**

- Social value**
  - Make renewable energy the primary power source in Japan to achieve carbon neutrality by 2050
- Non-financial value**
  - Intellectual capital: acquire the ability to construct a unique model encompassing all data required for wholesale electricity trading
  - Human capital: foster a more visible presence of researchers
  - Relationship capital: collaborate\* with business partners to strengthen our business conception and operation expertise in DER power systems using storage batteries

\* We have invested in Exergy Power Systems, which has ultrafast storage battery charge and discharge technology. We are creating new value through our collaboration. In addition, we have signed business capital agreements with the European analytics firm KYOS, with which we have developed a power price forward curve for the Japanese market. KYOS's modeling technology enables us to develop forward curves forecasting power needs down to 30-minute intervals and extending as far as three years in the future
- Financial value**
  - Number of entities to which we provide the MPX service: 60 (FY9/22)
  - Number of entities to which we provide asset management services for renewable energy generation: 6 (FY9/22)

### A Research & Recommendations

## Policy recommendations for achieving carbon neutrality

The turmoil in the energy market since the Russian invasion of Ukraine is increasing public demand for the decarbonization of society. We use our original energy supply-demand and economic models to analyze the impact of carbon neutrality on the Japanese economy and society. We are strengthening

collaboration with stakeholders in industry, government, and academia to ensure that action toward decarbonization will result in new industrial competitiveness for Japan. For example, we have proposed cross-disciplinary initiatives that transcend conventional vertical discourse.

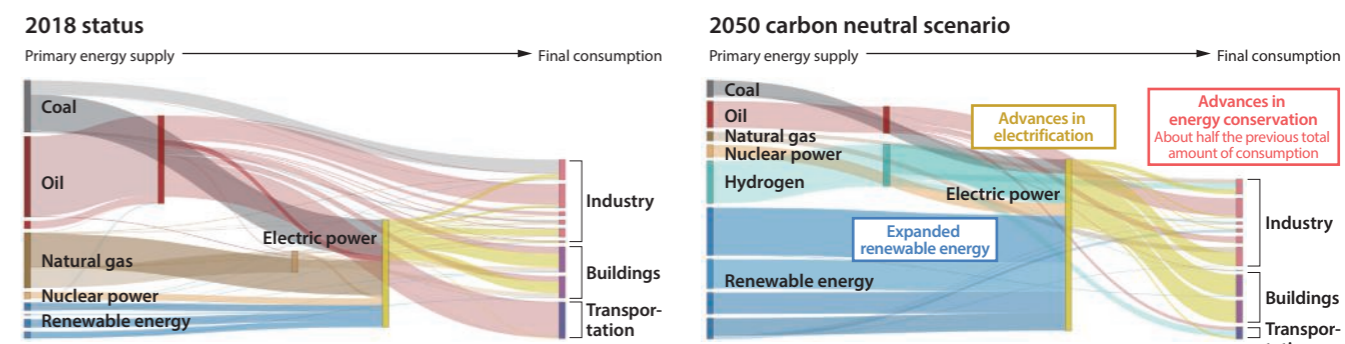


Chart shows the flow of primary energy that is produced or imported through a conversion stage to final consumption by sector. The vertical axis represents 100% of total primary energy supply. Source: Mitsubishi Research Institute based on Agency for Natural Resources and Energy, Comprehensive Energy Statistics

### D Societal Implementation

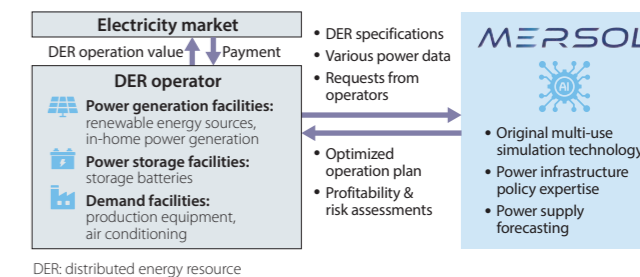
## Power infrastructure using distributed energy resources

Distributed energy resource (DER) systems make use of common power sources such as storage batteries, solar power, and electric vehicles. These systems are attracting attention as potential alternatives to the current structure of power supplied from thermal plants.

We support DER-based businesses with our MERSOL (MRI Energy Resource Solution) service that formulates optimized operation plans for users through our unique DER optimization algorithm. We additionally aim to eventually develop and operate our own DER business. Collaboration with startups is also under way, including investing in Exergy Power Systems, a company with a

growing track record in Europe of providing high-speed power supply-and-demand adjustment services using its own storage batteries developed in-house.

### MERSOL distributed energy operation service



## Transcending the think tank mold to bring solutions to society ourselves in the energy domain

My work involves developing and commercializing the MERSOL service platform, which combines our power-policy expertise with our unique simulation technology. In only a few years since conceptualizing the idea, we have made much progress in developing the platform while engaging with customers and the many stakeholders that the business model involves. While the project can be challenging at times, one thing I love about Mitsubishi Research Institute is that you're given the chance to try things that go beyond the traditional work of a think tank. This is very rewarding for me, and I will keep striving to tackle societal issues the MRI way.



Daisuke Miura  
Group Leader, Energy Business Group,  
Innovation Service Creation Division,  
Business Consulting Unit



# Financial and Credit Card

## We offer a broad spectrum of IT solutions that meet increasingly complex industry needs and provide the high stability required of societal infrastructure

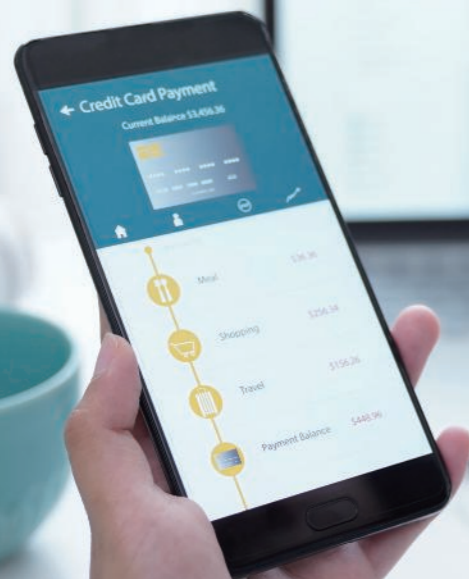
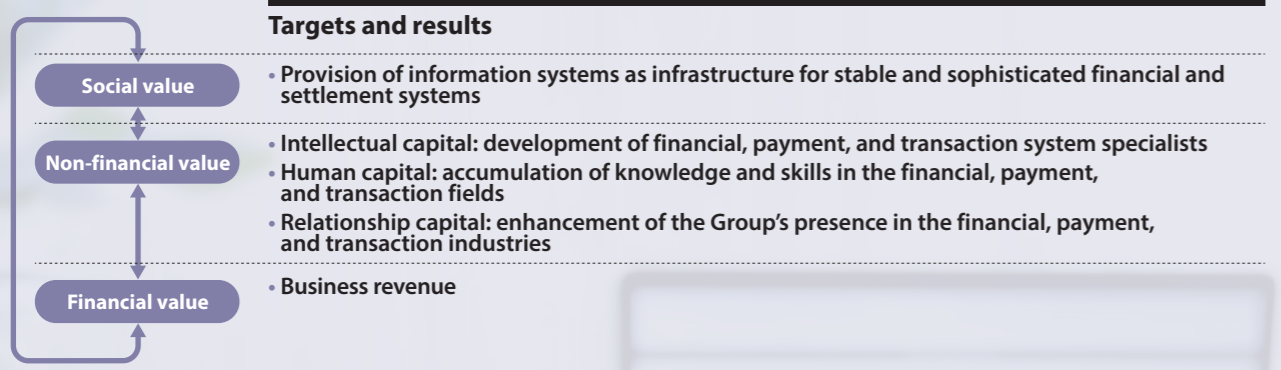
Societal infrastructure is the foundation for personal and economic activities, and its breakdown or failure can cause considerable turmoil and damage to society. People rely on the infrastructure to be highly stable, to the point that they typically don't even notice its existence. In addition, it must continually become more sophisticated for society to continue developing sustainably.

Mitsubishi Research Institute DCS specializes in supporting stable and sophisticated infrastructure in the financial, payment, and transaction fields. We use our wealth of business knowledge and expertise from many years of experience and actively incorporate the latest technologies to provide a broad spectrum of IT solutions to a diverse variety of customers.

DCS is expanding collaboration with Mitsubishi Research Institute (MRI) to achieve a fully integrated Group that provides solutions for a sustainable society.



**Toshihiro Shimizu**  
Electric Power Company Systems Development Division, Payment & Transaction Business & Systems Group, Payment & Transaction IT Unit  
Mitsubishi Research Institute DCS



## Anti-money laundering systems for the financial industry

MUFG Bank, one of Japan's leading megabanks, is actively working to build a globally integrated financial crime prevention program.

DCS is actively applying its knowledge of financial operations and leading technologies to develop anti-money laundering (AML) systems that will be able to promptly detect increasingly devious money laundering, the financing of terrorism, and other financial crimes. We provide stable and efficient system operation and maintenance services that provide security for customer operations.



## Rate calculation systems for the power industry

When the retail electricity market in Japan was deregulated in 2016, Tohoku Electric Power Co., Inc. responded to the intensifying competition by introducing a system enabling immediate application of multiple rate plans to better meet the needs of its small and household customers.

MRI and DCS conducted operation analysis for business viability and swiftly took to development, such as a rate calculation feature, subsequently completing the full rate calculation system. We continue to operate, maintain, and update the system. Our support for Tohoku Electric Power has also spanned the legal separation of operations as well as developing new rate plans to respond to the intensifying competition and the increasing use of renewable energy.



## Responsibility and motivation in working on critical systems for megabanks

AML is critical to banking operations. Developing AML systems carries a particular sense of responsibility because the systems must comply with various laws and regulations in Japan and overseas. Solving customer issues makes me feel like I'm directly involved in the development and security of society. I'm in charge of systems that are used in the branches of retail banks, so I have to respond quickly when there is a problem.

Introducing new systems can be quite unnerving and we set up large teams for the process. But I always feel a great sense of accomplishment and satisfaction when we confirm that they're running smoothly.

**Yuki Tsushima**  
Global Banking Systems Development Division, Financial Business & Systems Group, Financial IT Unit  
Mitsubishi Research Institute DCS



# Digital Transformation

## We focus on five areas in guiding companies and the government through digital transformation

Governments and companies face a whole new range of societal issues due to diversifying lifestyles and globalizing enterprises. Digital transformation (DX)—the utilization of digital technology and data—is essential to responding to these issues.

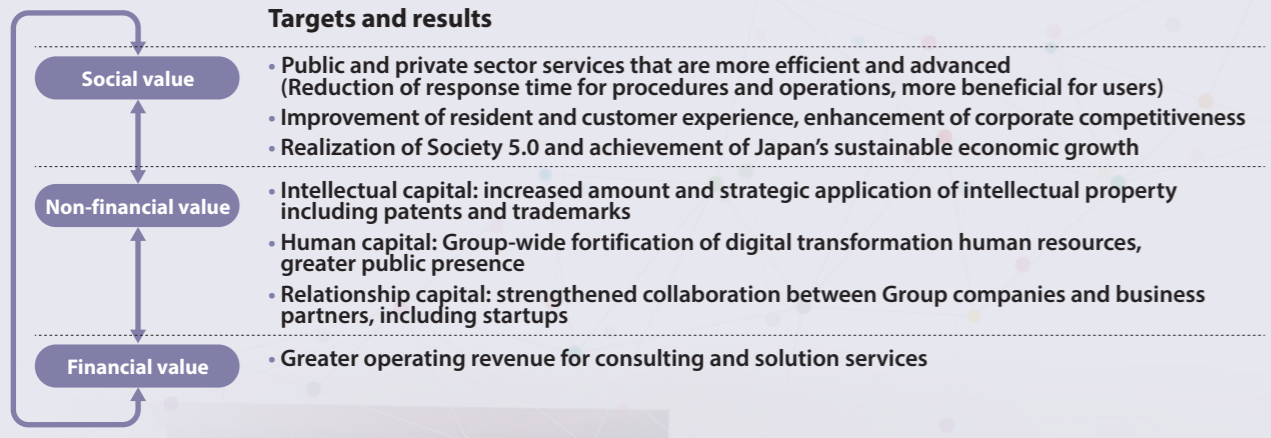
Right now, Japan is behind the curve for digitalization. In 2022, the International Institute for Management Development (IMD) ranked Japan's international digital competitiveness as 29th out of 63 economies worldwide and 8th out of 14 economies in the Asia-Pacific region. The country scored particularly low in the areas of business agility, human resources, and regulations.

We are focusing on five areas for supporting governments, financial institutions, and industry: the DX Journey®, data-driven management, national government DX, regional co-creation DX, and financial DX.



Eriko Honda  
General Manager, DX Technology Division

### Targets and results

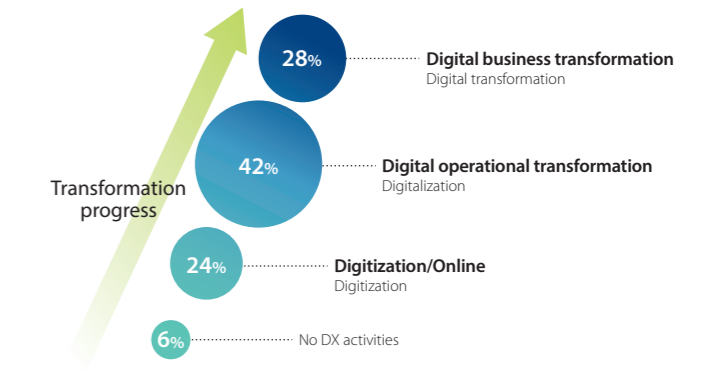


## Japan's digital transformation reboot

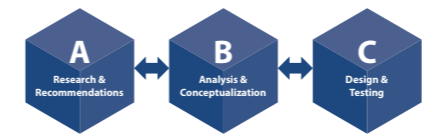
Our survey of digital transformation at Japanese corporations in December 2021 found that a large percentage have yet to achieve the full transformation of their business models: 20% were “digitizing” their analog processes, 40% were “digitalizing” with operational reforms based on digital initiatives, and 30% were “digitally transforming” their business models with digital technology. A chief cause of the lag is that many companies lack a vision for what they intend to accomplish through their digital transformation. Progress with DX does not directly relate to business performance, but of the companies that set a clear plan for implementing DX, roughly 40% showed improving earnings.

We are using the survey findings to stimulate Japan's private-sector digital transformation, such as by helping companies to set a vision that guides their initiatives and to digitally transform their existing businesses.

## Digital transformation among Japanese corporations



Source: Mitsubishi Research Institute, Survey of Digital Transformation Among Japanese Corporations\*  
 \* Period: December 2021  
 Subject: private companies in Japan with sales of ¥10 billion or more in the past year (1,000 companies)  
 Respondents: employees involved in their company's digitization and transformation



## DX Journey®: scripting the story of transformation

Long-term visions and goals must guide companywide mobilization to make use of digital technology in the creation of customer value and transformation of business models in line with management strategies. The DX Journey® is a tool for sharing long-term visions and goals by fostering an organizational culture for digital transformation and guiding a company toward achieving

results in the short, medium, and long term. We create for clients a navigational chart for their own DX Journey® and provide a combination of consulting and solutions to bring about transformation in five areas: organization, systems, business model, operations, and user experience.

### Five transformations in the DX Journey®

Area of transformation	Phases of business transformation			
	Current status	Shifts foreseeable from extension of current status	Digital-driven change	Digital-driven enhancement
User experience and customer interaction	Focus on sales	Strengthen maintenance and operation	Use IoT data for maintenance	<b>Reform to a service-based business model</b> <ul style="list-style-type: none"> <li>Shift to services based on usage</li> <li>Dynamic pricing</li> <li>Intricate revenue management</li> </ul>
Operations	Legacy systems, communication and coordination via email and telephone	Reform of front office operations	Reform the supply chain	
Business model	Analysis materials reformulated based on management interests	Improve profitability management	Reform business management	
Systems	Core systems that have become legacy systems	Partial automation and coordination	Modernize systems	
Organization	Lack of digital literacy and human resources	Dispel digital reluctance	Generate ideas, reform autonomously	
				Digital platform for outsourcing systems operations
				Share transformation goals



## Digital Transformation



### Cultivating diverse digital human resources

The 2022 white paper on information and communications issued by the Ministry of Internal Affairs and Communications lists “lack of human resources” as a major issue facing companies pursuing digital transformation. Progress will require a wide range of human resources, from those with technical skills in areas like data science and engineering to those with business skills in service design and organization

and project management. However, the overwhelming shortage of such digital human resources is hindering companies from recruiting new staff.

We help clients cultivate their digital workforce from within through a full palette of educational content and on-the-job training customized for digital-transformation projects.

#### Our typology for digital human resources

Type	Producer	Digital transformation manager	Business service manager	System and technical manager
Main roles	<ul style="list-style-type: none"> <li>DX promotion leader</li> <li>Chief Digital Officer</li> </ul>	<ul style="list-style-type: none"> <li>DX planning and promotion</li> <li>Stakeholder coordination</li> </ul>	<ul style="list-style-type: none"> <li>Service and business design</li> <li>Future vision creation</li> </ul>	<ul style="list-style-type: none"> <li>Realization and implementation of post-transformation services and operations based on technical capabilities</li> </ul>
Positions	<ul style="list-style-type: none"> <li>Producer (program manager)</li> </ul>	<ul style="list-style-type: none"> <li>Product manager</li> <li>Business designer</li> </ul>	<ul style="list-style-type: none"> <li>Business designer</li> <li>Data scientist</li> <li>UI/UX designer</li> <li>Product manager</li> </ul>	<ul style="list-style-type: none"> <li>Tech leader</li> <li>Advanced technology engineer</li> <li>Engineer/programmer</li> <li>Data scientist</li> </ul>

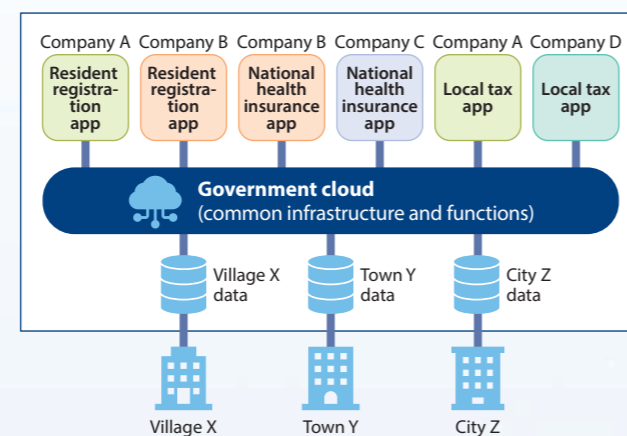


### Toward the digital society Japan aims for

The Japanese government, led by the Digital Agency, is seeking to create a digital society to ensure the wellbeing of the public, strengthen international competitiveness, and achieve sustainable and sound economic development.

We provide a variety of services to support the digital transformation of the public sector. For example, we are helping local governments transition their core operating systems to the government cloud, the digital cloud being created by the Digital Agency. By using this, local governments will be able to provide citizens with highly convenient public services that are quick, flexible, secure, and cost-effective.

#### Government cloud



### International partnership: digital-transformation startup in France and Europe's largest cloud-service provider

In April 2021, we entered into a capital and business partnership with ForePaaS, a French startup specializing in digital transformation. We support client data-driven management by utilizing the ForePaaS all-in-one Platform as a Service (PaaS) capable of carrying out all of a company's big data analytics.

In April 2022, we signed a business alliance agreement with OVHcloud, which has acquired ForePaaS and is a leading cloud service provider in Europe. We plan to collaborate with OVHcloud on operations in the data analytics field in Japan.

#### Platform service features

#### Digital transformation made possible through partnership with overseas IT companies

I am involved in activities ranging from the business and capital alliance with French company ForePaaS to applying their cloud-based big-data analytics service to data utilization and service development within the company and for clients. The timely application of cutting-edge technology for use by society to achieve digital transformation can be quite complicated, but these goals are within ever closer reach thanks to our work with overseas IT companies. Our accomplishments have also led to a partnership with OVHcloud, a leading European cloud service company based in France. We will continue to work with domestic and overseas partners to facilitate the digital transformation of a wide range of fields and to take on the challenges of changing society.



**Iwato Amano**  
Financial DX Engineering Group,  
Financial DX Division,  
Digital Transformation Unit