

## Innovation

# Value Creation through Digital Transformation

MCHC is applying digital technologies and developing the capabilities to achieve digital transformation (DX), which will allow us to create new value through innovation.

### Accelerating digital technology development and deployment

MCHC established the Digital Transformation Group (DXG) in 2017 to promote DX across the broad portfolio of MCHC Group companies. Since then, DXG has served as a central core of digital expertise, a stimulus for operating companies to develop their digital capabilities, and a resource for individual projects. Our overall approach has been to identify high-value initiatives that can be refined and targeted for broad adoption across the MCHC Group.

### Engaging with high-value initiatives through digital applications

For example, we are applying digital technologies to improve product quality, optimize and automate business processes, and accelerate R&D. Specifically, we have implemented image-based quality control of specialty chemical products using automated identification of defects. Using data analysis and optimization tools, we have created methods to optimize supply chains to meet customer and market demands in our global markets. And we are exploiting

Materials Informatics to speed up materials discovery R&D, while also deploying the technology for pathfinding applications at relevant business units. These examples illustrate the increasing contribution of DX to strengthen manufacturing, business and R&D processes across the MCHC Group.

### Fostering “digital natives”

Ultimately, our purpose in applying these digital innovations is to enable the creation of novel operational, customer, and social value. Now that DX has become well established within the MCHC Group, we are moving beyond our initial focus on operational excellence to initiate projects that create customer and social value. In addition to promoting open innovation beyond industry boundaries, we are laying the foundation for data-driven management by nurturing a new generation of “digital natives” through extensive digital education and the adoption of new ways of working (see P. 50). In this way, even as we execute projects that add value today, we are strengthening our digital foundation to enable continuous advancement in the years ahead.

### Comments from the Chief Digital Officer

**We generate innovation from change created by each employee, walking together on the path to transformation.**

In this time of unpredictable change, innovation plays an increasingly important role in business growth. Digital innovation does not arise from digital technology alone, but rather in combination with the resources of our company and the experience of our employees.

To create business value, it is important for each employee to see change as their own responsibility and to actively promote change. We will continue to promote DX activities across the entire MCHC Group, as a light that illuminates the path for a team that walks together.



**Naohiko Uramoto**  
Executive Officer  
Chief Digital Officer



Solutions to environmental and social issues

The Group's Material Issues  
• Intensification of DX

## Deploying mathematical modeling to optimize company-wide energy costs

MCC has a large number of manufacturing sites, some of which have their own power generation facilities and surplus generation capacity, while others purchase from electric power companies. One major cost reduction opportunity is to minimize energy costs such as electricity (utility) costs at the company level. To address this opportunity, MCC launched the Wide-Area Energy Cooperation Project in September 2017. In response to the Japanese government's liberalization of electricity policy, we needed a system to optimize and efficiently operate our power generation and power purchase plans among multiple locations.

DXG built and verified a large-scale mathematical model, consisting of three million variables, to optimize company-wide utility costs. We then worked closely with the plant teams to adapt this theoretical model for deployment. Coupled with a negotiation of contract terms with power companies, MCC reduced utility costs by 10% in fiscal 2020 compared to fiscal 2017. This significant efficiency improvement was achieved through collaboration between plant personnel, business units and digital scientists. Our current work centers on further refinement of the model and increased automation of demand optimization and decision-making, with the goal of rolling out the model across the entire Group.

### Creating Group synergies

## Integrating MCHC Group assets to develop next-generation healthcare businesses leveraging the microbiome

When MTPC became a wholly owned subsidiary, MCHC set up a synergy creation committee. This initiative led to a joint project to develop next-generation healthcare businesses leveraging the microbiome (the ensemble of microorganisms in the human body) by MCC, MTPC and the MCHC Group.

Under this project, data on microbiomes will be collected and market trends analyzed to provide intelligence to inform the development of business models. Decisions on where to focus (in terms of diseases and stages, from prevention to treatment and convalescence) will be made based on business potential.

We aim to provide healthcare services in the future, but over the medium term, we will provide food ingredients that tap into the microbiome. We are also considering the use of the collected data to create health-related service solutions.

### Initiatives for microbiome

**Mitsubishi Tanabe Pharma**  
Know-how in drug discovery

**Mitsubishi Chemical**  
Food ingredients and lactic acid bacteria businesses

Developing an infrastructure that integrates the technologies of the companies

Microbiome data | Data analytics | Intervention techniques

### Draw on data to develop a comprehensive healthcare business encompassing medicine and food

- | Food ingredients   | Services   | Medical care  |
|--|--|---|
| <ul style="list-style-type: none"> <li>• Ready-made meals</li> <li>• Processed foods</li> <li>• Food for long-term care and hospitals</li> </ul> | <ul style="list-style-type: none"> <li>• Health-related information</li> </ul> | <ul style="list-style-type: none"> <li>• Use in drug target discovery</li> <li>• Precision medicine through biomarkers and patient stratification</li> <li>• Prevention, pre-symptomatic disease care and prognostic interventions</li> </ul> |