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Special Feature 02

Technology Platform Supporting MHI Group

A Message from the CTO

Our technology platform—which we have built up over many years—is a key management resource supporting value creation at MHI Group. In this section, Tomoaki Omura, who assumed the position of CTO in April 2025, details how he will leverage these technologies to realize Innovative Total Optimization (ITO) and achieve sustained growth.

Implementing ITO with unwavering focus on staying ahead of trends and acting with speed

Tomoaki Omura

Senior Vice President and CTO

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Special Feature 02 ▷ **Technology Platform Supporting MHI Group**

The CTO's Mission
Revolutionizing our technology platform for the future

In addition to contributing to the ongoing business operations of MHI Group, the CTO's mission is to transform our technology platform and lay the groundwork for businesses that can underpin growth in the future. As the newly appointed CTO, my first priority must be to implement our corporate strategy of Innovative Total Optimization (ITO). CEO Eisaku Ito tested this methodology over a five-year period in his previous role as CTO, and he has already demonstrated its effectiveness. Building on those results, I will work to establish a virtuous cycle of high profitability and growth investments.

During my first 10 years at MHI, I worked on foundational research at the former Advanced Technology Research Center, focusing on the exploration of fundamental principles and theories. I subsequently moved to another research institute supporting product development, where I oversaw the start-up of the first plant utilizing a new design. Although I struggled at first in this role, I studied hard, and by verifying my hypotheses and applying the results at a commercial plant, I made a positive contribution to our customer's operations. This experience became a cornerstone of my career. After that, I was transferred to the Technology Planning & Management Department at our corporate headquarters, where I became involved in the Group's overall technology strategy. There, I engaged in many discussions with visionary members on how to create technologies applicable across multiple businesses and deploy them across the Group. As a result, I developed a strong sense of identity and responsibility as a member of MHI Group. That mindset continues to serve me well today as I oversee our Shared Technology Framework in my role as CTO.

The Key to Realizing ITO
Information sharing and foresight

Let me begin by addressing two essential prerequisites for the realization of ITO: information sharing and foresight.

The first pillar of ITO, Group-Wide Optimization, has two perspectives—vertical and horizontal—and the free sharing of information is indispensable to both. Given the diversity of our businesses and the size of our organizations, information sharing definitely remains an issue for the Group. To address this issue, we aim to eliminate rework and redundant tasks across value chains—in such areas as sales, development, and engineering—by building a digital information platform to enable the instantaneous sharing of important information. While this falls under the category of vertical Group-Wide Optimization, it also supports optimization in the horizontal direction, i.e., the sharing of information across multiple businesses.

In addition to information sharing, foresight is essential. If we anticipate macro trends and underlying market needs, develop the necessary technologies, and standardize them in advance—rather than responding after changes occur—we can launch products in the market ahead of other companies. Standardization reduces human error, and using the same components in assembly can also lower procurement costs, resulting in numerous benefits and helping to create a virtuous cycle. By delivering value to more customers in this way, we will achieve Reach Expansion, which is the second pillar of ITO.

Here, it will be essential to make sure that the means do not become the end. When looking to improve production process efficiencies, for example, we must not allow automation to become a foregone conclusion. In other words, automation should serve an objective, not become the objective itself. We need to identify what the actual bottlenecks are in a process and resolve them using the optimum method. The same applies to the development of human capital. Our aim is not to simply educate and develop talent; we must determine how to increase competitiveness, identifying what kinds of technology and talent are required to do so. Unless we break down issues into their component parts, we will not be able to formulate a human capital strategy that truly raises our competitiveness. By continuously seeking out the core essence of each issue, we will strive to realize ITO.

Accelerating ITO Implementation and Enhancing Competitiveness
Promoting digital transformation

Digital transformation (DX) will be indispensable in the drive to implement ITO. Digital technology may not be the first thing that comes to mind when people think of MHI Group, but we actually have a robust internal suite of these kinds of technologies, such as communications, sensors, and control systems, which are core capabilities of ours.
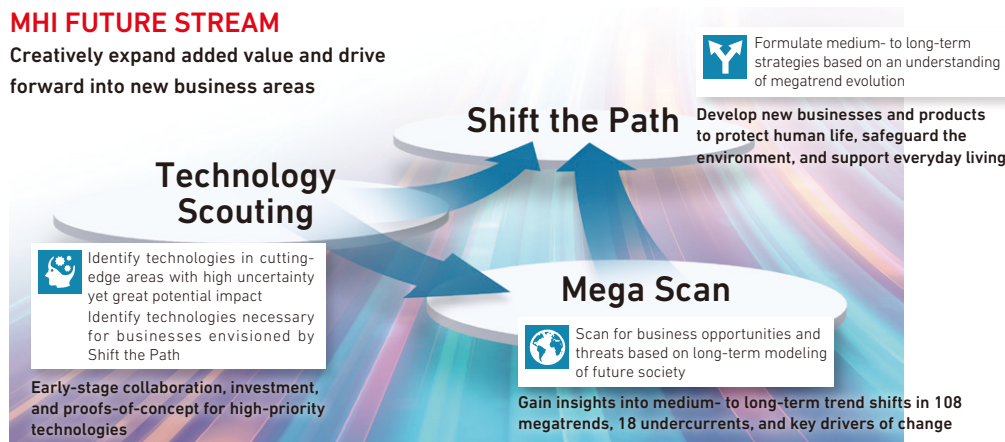
In 2022, we established the Digital Innovation Headquarters under the Shared Technology Framework. Under the ΣSynX (Sigma Syncs) concept—which seeks to create new value through smart connections among a wide range of machinery products and services using digital technologies—we are implementing DX across diverse business areas, including logistics, energy management, and e-commerce. Due to our strong DX capabilities, combined with

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MHI FUTURE STREAM

Creatively expand added value and drive forward into new business areas

Technology Scouting
Identify technologies in cutting-edge areas with high uncertainty yet great potential impact
Identify technologies necessary for businesses envisioned by Shift the Path
Early-stage collaboration, investment, and proofs-of-concept for high-priority technologies

Shift the Path
Formulate medium- to long-term strategies based on an understanding of megatrend evolution
Develop new businesses and products to protect human life, safeguard the environment, and support everyday living

Mega Scan
Scan for business opportunities and threats based on long-term modeling of future society
Gain insights into medium- to long-term trend shifts in 108 megatrends, 18 undercurrents, and key drivers of change

management's high level of commitment and engagement with stakeholders, we were selected for two consecutive years (2024 and 2025) as a DX Stock by Japan's Ministry of Economy, Trade and Industry, the Tokyo Stock Exchange, and the Information-technology Promotion Agency.

We are also focused on developing human capital to support our forward-looking DX initiatives. To this end, we are working to raise the digital literacy of all employees through e-learning and other methods. At the same time, we have outlined the criteria for the digital talent needed to lead product development and process reforms, deploying education programs company-wide. Our aim is to cultivate more than 20,000 digital professionals by 2030.

As part of our DX initiatives, we are working to apply AI to both products/services and internal operations with the aim of enhancing their added value and competitiveness—while improving the efficiency of internal operations. Machine learning techniques have already been applied widely across our manufacturing and services. Furthermore, we are proactively introducing generative AI into internal operations to improve efficiency in such areas as information gathering and document drafting/summarization. Furthermore, we have developed internal guidelines for the utilization of generative AI, ensuring that output accuracy is thoroughly checked, confidential and personal information is appropriately managed, and copyright and ethical considerations are taken into account.

MHI FUTURE STREAM
Continuing to explore business opportunities to support future growth

Our MHI FUTURE STREAM program has been a touchstone for our efforts to explore business opportunities since 2018.

MHI FUTURE STREAM consists of three initiatives: Mega Scan, which outlines medium- to long-term scenarios regarding changes in the macro environment; Shift the Path, which explores business opportunities based on hypotheses regarding innovation in markets and technologies; and Technology Scouting, which searches for disruptive technologies with major impact and fosters co-creation with external partners. Through this program, we have identified around 100 megatrends and 18 undercurrents with major implications for the company. We are now exploring the direction of shifts occurring in the Group's businesses in response to these key megatrends. Based on this research, we are working to formulate and deploy R&D strategies. To date, we have tested more than 2,000 hypotheses and are currently pursuing around 20 new projects.

Megatrends may vary in terms of speed of evolution, but these are generally not abrupt changes. When comparing 2018 and 2023, around 90% of the megatrends remained the same. Incidentally, pandemics were included as a megatrend in 2018. Using MHI FUTURE STREAM as a jumping off point, we are preparing the Group to flexibly address sudden changes in society.

Enhancing Corporate Value
Harnessing cutting-edge technologies to strengthen competitiveness

Looking back over our 140-year history, MHI Group began by adopting advanced technologies from overseas, eventually improving and localizing them to build our current technology platform. In addition to preserving and continuously improving on these technologies, we are developing new technologies in anticipation of future societal and market trends. In recent years, we have increased investments in R&D, with R&D expenses in FY2024 totaling around ¥220 billion (including commissioned projects), which is equivalent to 4.3% of consolidated revenue. We allocate these expenditures in a well-balanced manner to our growing core businesses of GTCC, Nuclear Power, and Defense; to future growth areas, such as data centers and the Energy Transition; and to digital technology initiatives aimed at enhancing the competitiveness of our businesses.

As CTO and leader of the Shared Technology Framework, I will focus on identifying cutting-edge technologies and further strengthening the competitiveness of the Group's products. That said, even if we succeed in developing products that help solve the issues facing society, we cannot expect to receive orders unless there are customers who actually need those products. Therefore, we must create offerings that both respond to society's needs and deliver value to the customer. Moreover, if we were to plan to launch a product a year from now—for example—a competitor could bring an offering to market sooner than us. Thus, it is essential for us to remain keenly aware of developments in our operating environment as well as customer needs, ensuring that we can respond quickly to both. As CTO, I am fully committed to this mission.