Message from the Officer-Technology, Intellectual Property, and DX Strategies



We will continue developing new technologies and cultivating our human resources to create innovative solutions.

Enhancing our technological capabilities through diverse human resources to generate business creation and growth

Technological evolution is essential to maintaining our status as a company needed by society. We need to respond to changing trends, decide which technologies and techniques to use, and determine which technologies we will be relevant in the future. As a director in charge of technology development, I am constantly seeking to identify technologies that will ensure we are up-to-date and prepared for future trends while maintaining and fortifying our fundamental technologies and nurturing technologies that will become the core of our business in the future.

At the same time, it's people that create and improve technology. I view technology as being people and believe that we will strengthen our technological capabilities by cultivating our human resources. Kawasaki Heavy Industries passed down a DNA of taking on challenges and refining manufacturing processes and from that we have introduced many firsts in Japan and the world. To create and grow businesses, we need to continue developing human resources who boldly take on the challenges of new businesses seeking to provide solutions for complex and ever-changing social issues.

The Group Vision 2030 sets an objective of providing timely and innovative solutions for an ever-changing society. Our people must be highly motivated to create the businesses that society demands. The technology field is also changing with society and the times, and the human resources that will be needed are also diversifying. We will strengthen our human capital by determining what technologies will be needed in the future and then carefully defining and cultivating the human resources that will be needed.

The three key themes we have chosen to guide us to fulfilling the Group Vision 2030 are Frontier, New Values, and Cross Over. These have the common link of creating new markets. I would like to share some of the major initiatives we are undertaking to achieve Group Vision 2030 and my thoughts on the human resources that will be needed for the initiatives that I have had from my experience putting them into action.

Frontier: Pioneering the technology frontier with our challenger DNA

The Group-wide initiative to develop the hydrogen business is an excellent example of the Frontier theme. We launched the hydrogen business in 2009 in anticipation of the advent of a low-carbon society and the need for energy security. We used manufacturing technologies we had accumulated, such as storage tanks for liquefied hydrogen and hydrogen-fueled gas turbines to generate electricity. Right there is where we need to have human resources to lead product development who are persistent and have specific technical expertise. At the early stages, we also need to move before other companies to establish a supply chain. For that we need human resources who can see the big picture while moving a project forward, and others who are versed in standards, laws, and regulations to lead the market formation for new businesses.

In addition, in new fields such as agriculture, forestry, and fisheries, where we have not previously ventured, challenges are emerging that will lead to solutions to social issues through the cooperation of engineers with new approaches to food security and human resources with entrepreneurial mindsets who can work with our technologies. With these new opportunities, people who have not been inspired within the framework of the manufacturing businesses are now able to demonstrate their true abilities and are working with enthusiasm.

New Values: Providing innovative solutions to the problems facing the world

Prime examples of the New Values theme are the development of medical robots, such as the *hinotori*TM Surgical Robot System, and service robots, including the FORRO indoor delivery robot. The challenge we are taking on here is to adapt our existing robotics and mobility technologies to provide solutions for the emerging medical and service fields.

The hinotoriTM has been highly praised for its design features to accommodate the specific needs of physicians such as compactness that does not interfere with surgery, its high level of safety, and its ease of maneuverability.

The FORRO indoor delivery robot was specifically designed to reduce the burdens on medical professionals so they can concentrate on "work that only a human can do." We are presently collaborating with Microsoft Corporation to accelerate the introduction of cutting-edge digital and AI technologies to develop robots with even more versatility for the medical as well as the service industries.

Both of these technologies are wonderful examples of success by human resources addressing social issues by fully understanding the people who will use them, thinking deeply about what is truly needed, and developing them into products and solutions.

Cross Over: Becoming a creative challenger that continues to grow by breaking barriers

Under the Cross Over theme, we established a research

association with Toyota Motor Corporation and four leading Japanese motorcycle makers to accelerate development of compact hydrogen engines with the aim of achieving carbon neutrality for small mobility vehicles. Collaborations that reach beyond usual boundaries are becoming increasingly essential to address the new and increasingly complex challenges. Hydrogen is very complicated to work with, and this collaboration is speeding up our development of basic technologies.

In January 2024, the collaboration's HySE-X1 hydrogen-powered buggy successfully completed the Dakar Rally, widely considered the world's toughest motor race. Focusing our companies' strengths and working together to develop the technology has produced significant results in just a short period of time. In the past, creating new value by partnering with competitors was unthinkable, but it is because of our human resources that we now have a new road for producing value in the future.

While engaging in collaborations, we are also focusing on intellectual property activities linked to our business strategy. In the hydrogen business, our aim is to take the lead in the industry and country in developing hydrogen-related markets with a balance of "open (standardized)" market creation activities and "closed (intellectual property)" strategies to secure our profit capability. From this perspective as well, the importance is also growing to have human resources capable of seeing the business potential in intellectual property and linking it to producing profits.

Diversity drives growth Investing in future business and human resources

To fulfill Group Vision 2030, we are also transforming the way we work so employees can concentrate on producing higher added value and feel satisfied and growth in their work. We will use AI and other technologies to create an environment where every employee can work more creatively, and to formulate a system that improves operating efficiency while preventing defects and improving design quality.

I believe the most important part of developing human resources is experiencing success. We have training programs employees can use to improve their skills, but we also want them to take on challenges so they can gain experience. My role is to create the place where they can do that. Kawasaki Heavy Industries has a diverse workforce, and I'd like to bring out each individual's strengths and ideas to mix them together in potent ways that will give rise to new value. We want to develop technologies and explore new businesses to encourage the growth and success of our human resources so our businesses and our whole company will continue thriving and growing.

Kawasaki Messages from Management and Strategy

Practice of Strateg Performance

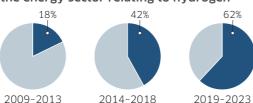
/ Making Upfront Investments in Future Core Technologies to Establish International Standards and Markets

In 2009 Kawasaki Heavy Industries has begun taking full-scale action to build a liquefied hydrogen supply chain. We have made substantial investments into R&D on core hydrogen-related technologies with government support. The results of that investment have led to the development hydrogen liquefaction systems using purely-domestic proprietary technology, a first for industrial use, as "production" technology (2014), verification of hydrogen power generation in an urban area, a world's first, as "utilization" technology (2018), and a technology demonstration of marine transportation and loading/unloading using the SUISO FRONTIER, the world's first liquefied hydrogen carrier, as "transportation" technology (2022). In this way, we have developed at an early stage the core technologies that will be necessary for creating a hydrogen society and have obtained patents for supply chain-related products.

In addition, by establishing international standards from the technology development stage, we seek to differentiate our products from those of other countries and create a market for hydrogen supply chain-related equipment for which Japan has an advantage. In

recognition of these efforts, we were selected as a company with a high rating in the market formation potential index in the survey of awareness concerning corporate activities for solving social challenges conducted by the Ministry of Economy, Trade and Industry.

Proportion of R&D investment in the energy sector relating to hydrogen



Number of hydrogen-related patent applications

	2009-2013	2014-2018	2019-2023
Production	10	19	13
Transportation and storage	8	58	210
Utilization	47	38	90

Efforts to create international standards for the hydrogen supply chain



SUISO FRONTIER, the world's first liquefied hydrogen carrier





(FY)

A large liquefied hydrogen carrier

/ Contributing to Business through Strategic IP Activities

The initiatives in the hydrogen business described above focused on intellectual property activities linked to commercialization and R&D with the objective of creating a liquefied hydrogen supply chain. The Kawasaki Group's intellectual property activities are conducted through a three-pronged approach that combines business and R&D with intellectual property. Intellectual property is positioned as key management resources that contributes to the sustainable improvement of corporate value, and IP activities are strategically undertaken in line with business activities. For instance, IP activities that look to the future include measures for building a patent network and developing a brand so that competitive advantage can be gained in the future.

These IP activities were recognized, and we were selected for inclusion in the list of Top 100 Global Innovators 2024 prepared by UK-based Clarivate Plc, a global information service company. This is the eighth

time that we have been included in the list since the first time in 2015. The list recognizes the top 100 innovative companies and institutions that lead the world in technological R&D. Of the four assessment criteria, we received particularly high scores on "influence," which indicates the degree of influence that a company has on the patent applications of other companies, and "rarity," an indicator of the combination of diverse technologies.



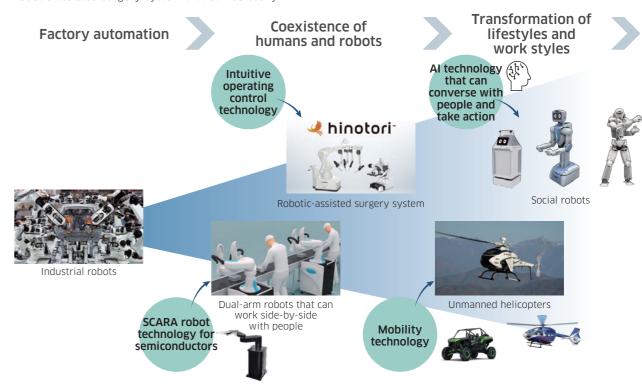
Received the Top 100 Global Innovators 2024 trophy

/ Seeking to Expand Robot Applications by Combining Technologies

Starting with the provision of industrial robots that meet factory automation needs, we seek to expand robot applications by developing new robots that can address various social challenges through the utilization of diverse technologies from inside and outside the company. For instance, we developed duAro, a dual-arm robot that can work side-by-side with people using SCARA robot technology for semiconductors, and *hinotori*TM, a robotic-assisted surgery system that can be easily

operated with a high degree of precision as a result of the use of advanced and precision control technology, achieving coexistence of humans and robots.

In addition, we are adopting our own mobility technologies and the AI technologies of cooperating partners, such as Microsoft, to greatly expand the scope of application of robots and make robots a more familiar presence in day-to-day life.



/ Developing the Human Resources Who Will Be the Drivers of Growth

In recent years, the Kawasaki Group's business has required advanced integrated systems, product-related services, and the utilization of ICT, IoT, and AI. In response, we have prioritized the development of human resources to improve the level of system engineering skills needed to design and develop those capabilities. In addition, not only are we developing specialists in specific domains, we are also cultivating versatile talent with broad knowledge across multiple technological areas so that we can achieve sustainable growth amidst a rapidly changing and highly uncertain social environment.

To effectively utilize rapidly advancing AI technologies and digital technologies in our business, we are also focusing efforts on the broad dissemination of these capabilities throughout the company, regardless of business division or occupation, by holding seminars and other events. For example, we held the Vision AI Seminar to laterally disseminate within the company information on key points for product development

using AI technologies that can recognize and identify images. In addition, we regularly hold Data Utilization Seminars for employees who have an interest in using data but lack a clear image of how to do so. Thousands of employees from across the Group in both technical and administrative positions have participated in these seminars, and we have received numerous inquiries from frontline operations regarding introduction.



Conducting Data Utilization Seminars

Kawasaki Report 2024