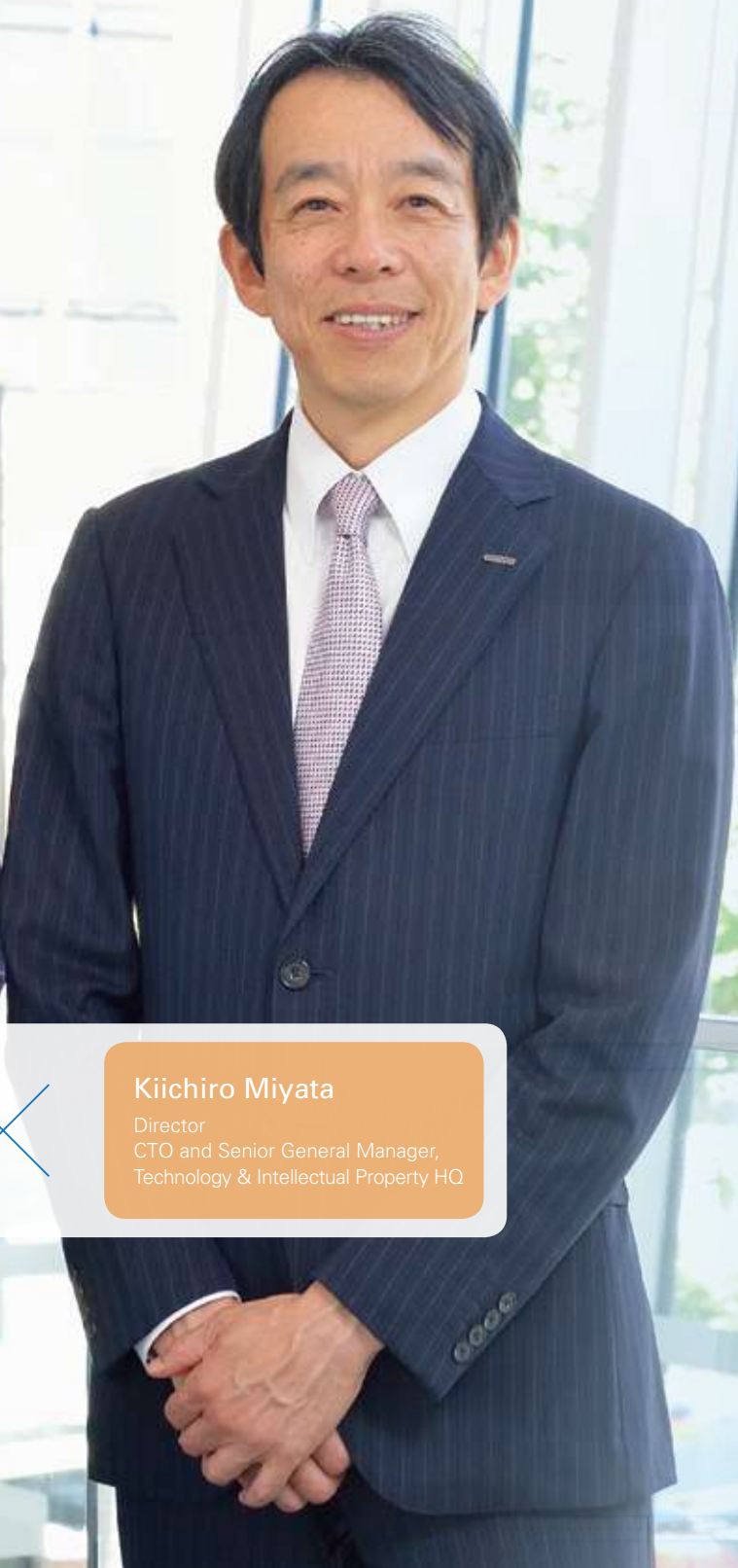


Driving Manufacturing Innovation through Technology and **innovative**-Automation



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The Future of Manufacturing in the Years 2020, 2030, and Far Beyond.

Social Needs and OMRON Ambitions in the Factory Automation Market

Igaki We are seeing an increasing number of challenging issues in the factory automation market, including soaring labor costs and labor shortages. Given these issues, how do you see the factory automation market changing as we head toward the years 2020, 2030, and beyond? What moves will OMRON make to deal with these changes?

Miyanaga Automation on the production floor will accelerate among emerging economies where labor costs are beginning to rise. At the same time, the developed countries are struggling with aging-related labor shortages. As it is getting more difficult to pass down the craftsmanship of skilled workers, we have to find some way to replace this with machinery and equipment. Even more, we are inundated with new innovations in technology, which include Artificial Intelligence (AI), the Internet of Things (IoT), and robotics. Factory automation companies around the world are scrambling to make use of these technologies. In fact, the factory automation market is going through such a dramatic period of growth that we could well call the start of the second age.

Miyata To produce new value in the factory automation market, we must make full use of new technologies such as AI and IoT to make machinery smarter. What is required is a fresh approach. In 2011, OMRON added the idea of + THINK to evolve our core technology concept of Sensing & Control. Why + THINK? Because we believe we can create new value by moving beyond simple programmed actions for machines. We are moving to a stage where we will add human intelligence to machine behavior. The + THINK concept is what will help us bring amazing innovations in factory automation to the production floor. We have been showing our *FORPHEUS* table tennis coaching robot to people throughout the world. This is a tangible example of Sensing & Control + THINK. By incorporating AI technologies, we have made the robot smarter to help the human player become better at table tennis. This is a true representation of the evolution of OMRON technologies. Our dream is to link these core technologies to growth in our business as we solve social issues.



Interviewer

Tsutomu Igaki

Executive Officer
Senior General Manager,
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OMRON is an Innovative Manufacturing Technology Partner, Offering our Customers the Greatest Lineup of Products and Application Software in the Industry for Their Needs

Igaki As the factory automation market grows, competition is becoming more intense. How do you assess the unique OMRON initiatives and strengths?

Miyanaga One of our strengths in factory automation is our incredible lineup of automation products. We offer customers a full-automation solution from one source. Over the past few years, we have added to our lineup of products through acquisitions, raising our ability to provide total solutions to solve the business issues of our customers. Beyond sensors, controllers, servo motors, and a wide range of other products, we also offer innovative application software to control robotics and other components tailored to customer needs. This is just one of the areas in which OMRON excels over rivals in the industry. The seamless integration of the largest product lineup in the industry, along with high-speed, high-

precision machine control is critical for advanced manufacturing. We believe that there are certain things that only OMRON can do as a comprehensive factory automation equipment manufacturer. We serve many customers as an innovative and highly respected manufacturing partner.



■ Largest Product Lineup in the Industry



Igaki Nothing makes a factory automation equipment maker happier as when their products and services help customers increase their productivity. What about the technology aspects?

Miyata Obviously, application software is a tremendous strength of ours. We have so many unique solutions to offer, built on our accumulation of expertise and data from the production floor. We will be happy to hear from many more customers telling us they want to use our hardware to take advantage of our application software. Another OMRON strength is our componentization technology, which we incorporate into our final products to answer customer needs. One might think hardware or software when they hear about technological evolution. Componentization technology, however, is extremely challenging to accomplish, and serves as a key differentiation factor. For example, a number of companies have designed algorithms that use AI. Very few, however, have successfully incorporated AI into their products. In 2018, we plan to sell a first-of-its-kind controller that incorporates AI. While it might appear to be a simple matter, shaping a leading-

edge technology to a tangible form and delivering maximum performance is no easy task. Our depth of experience in embedding software into small packages has resulted in proprietary expertise allowing us to take advantage of this technology.

Miyanaga Of course, software development alone cannot maximize production equipment capacity for our customers. We continue to work on integrating hardware and software, pursuing the type of value that only we can provide.



A New Concept Bringing Innovation to Manufacturing: **innovative**-Automation

Igaki Our Industrial Automation Business (IAB) has announced the strategic concept of **innovative**-Automation. This strategy introduces technological innovation to the production floor for innovative manufacturing. Can you tell us more about specific **innovative**-Automation initiatives?

Miyanaga **innovative**-Automation is a concept that lies at the intersection between market needs and the unique OMRON value proposition. This concept represents our deep commitment to bringing innovation to manufacturing. **innovative**-Automation incorporates three “i”s to produce

manufacturing for the future.

The first “i” stands for Integrated. We just discussed the interaction between our deep product lineup and our control application software. This interaction makes it easy to realize of innovative manufacturing, including ultra-high-speed control and ultra-high-precision processing. The second “i” stands for Intelligent. The integration of control and information improves productivity and quality dramatically. The AI-equipped controller accumulates vast amounts of data from the production floor through IoT-compatible sensors. Based on this data, the AI infers the status of the

equipment, predicting product defects and equipment breakdowns. Our aim for the future is to create production lines with no unplanned stoppages and equipment that produces defect-free products. The third “i” stands for Interactive, which is the harmony between human and machine. As labor shortages become worse, the need for robotics on the production floor becomes greater. At OMRON, we are solving these needs by developing robots that work in harmony with humans. In the future, humans, machines, and robots will be aware of each other, resulting in a completely new type of manufacturing in which all elements on the production floor work in concert.

Miyata The OMRON Technology & Intellectual Property Headquarters is busy developing algorithms to speed underlying technologies for **innovative**-Automation. Developers cannot create good algorithms

without understanding how they will be used at the customer site or how they should be modified. **innovative**-Automation begins with the needs of the customer. Useful algorithms cannot be developed without expertise in manufacturing and technology, nor can they be developed without the ability to uncover customer needs.

innovative-Automation incorporates three “i”s

Concept	innovative -Automation Innovations in manufacturing
Direction of Evolution	Evolution in control integrated
	Intelligence developed through ICT intelligent
	New harmonization between humans and machines interactive

Working with Partners to Create New Value

Igaki Working with partners is one key for OMRON to evolve in the factory automation market. Is the IAB engaged in any specific projects at present?

Miyanaga We believe in the importance of working cooperatively with our customers. We must do even more to integrate with our customers on their production floors to understand their underlying business issues and create products and services accordingly. For example, we worked with our customers to develop a product known as the industry’s most environment-resistant series of oil-resistant components. We had many customers who were

struggling with malfunctioning sensors and switches, damaged by cutting oil used during the automobile component manufacturing process. These malfunctions raised the risk of unexpected production equipment stoppages. Recent developments in cutting oil have made processing more efficient. As cutting oil becomes more popular, the impact on surrounding control equipment has become more severe. In response, we conducted experiments on customers' production floors, which led to the development of products with outstanding oil-resistance. Such steady efforts not only allow us to understand production floor issues, but they also have the important effect of strengthening



our customer relationships. We are also contributing to solving production equipment issues through total solutions. For example, one Intelligent initiative within **innovative**-Automation is to work with our customers to validate data useful for productivity improvements. We plan to create new systems with our customers, learning equipment-related issues and determining the type of data needed to solve these issues. Our broad lineup of products allows us to collect data from every process related to production equipment. Using this data to propose all-encompassing improvements to our customers is another tremendous strength of our company. At present, we are engaged in a number of projects with customers, aiming to generate greater productivity improvements. As a comprehensive manufacturer of factory automation equipment familiar with production floor issues, OMRON is working to add value and functionality to every product we make. Even more, we will continue to leverage our total solutions to offer innovations in manufacturing that originate with our customers' needs.

Igaki Mr. Miyanaga has discussed working together with partners on the factory automation production floor. What about ongoing initiatives at the Technology & Intellectual Property Headquarters?

Miyata By working together with partners, we not only create solutions together, but we also have an opportunity to expand our own perception to build new concepts.

The Technology & Intellectual Property Headquarters coordinates with a wide range of universities, research labs, and other groups to advance open innovation across a variety of fields. The RIKEN BSI-OMRON Collaboration Center established on June 1, 2017 is one example. This is a joint project with RIKEN, Japan located within the RIKEN Brain Science Institute. The center investigates the relationships among brain activity, the human body, and human psychology, aiming to create next-generation technologies through the integration of neuroscience and AI. We expect our engagement in this new field of neuroscience will lead to solutions for social issues through our factory automation business, as well as a wide range of businesses throughout our company. OMRON will continue to create new value, accelerating open innovation initiatives, incorporating knowledge from all sources, and encouraging the use of OMRON technologies in a wide range of applications outside our company.

Igaki You two assured that OMRON will be moving even faster toward medium- and long-term growth. Thank you.