CTO Interview

Evolving Near-future Design

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The Powerfully Revolving Engine of Innovation

In the previous medium-term management plan "VG2.0," OMRON set out an overall policy, "innovate through technological evolution to achieve self-driven growth" over the next 10 years. As CTO, what are your thoughts on the results of VG2.0 and how do you see technology management evolving?

OMRON has grown by predicting the future and pioneering solutions to society's needs. However, following my appointment as the first CTO in 2015, when I asked engineers at the Technology & Intellectual Property HQ "What do you think is the purpose of this research?", I was frequently unable to get a clear answer. Perhaps R&D itself had become the objective, and the key point of addressing society's needs had been forgotten. That made me determined to build a platform for OMRON-style innovation.

Following thorough discussion, to enable seamless planning and development of business and technology required for innovation, in 2018 we established two organizations: Innovation Exploring Initiative HQ (IXI) delineating an architecture from a business perspective and OMRON SINIC X Corporation (OSX) responsible for near-future design. Another major achievement of VG2.0 was the establishment of a "business creation process" to create a state in which we can create new businesses one after another.

As a result, new business and R&D themes are openly discussed, and moreover, everyone, from executives to those working on-site, is taking ownership of the objectives and value of those themes. I am convinced that along with the development of this framework, there has been a big change in the mindset of those working at the Technology & Intellectual Property HQ and IXI. They are rising to the challenge of new value creation. Technology development teams, though enthusiastic about their research, previously tended to be somewhat inward-looking. That has changed. Nowadays, they are extracting themes from social issues and engaging with external parties as well. As they accumulate achievements, they will gain confidence and take on greater challenges. They have begun to set new R&D themes themselves, not only from the perspective of existing

businesses, but also from that of near-future customer- and technology-oriented perspectives, and to undertake challenges at a high technical level. The innovation-generating process is becoming second nature to our people who are the key players in that process.

—— In SF2030, OMRON emphasizes "empowering people through automation." Referring to examples, please explain why you emphasize "empowering people" and the kind of society you are trying to achieve.

Automation has three phases: "substitution" when people's work is done by machines, "collaboration" when people and machines work together, and "harmony" when human possibilities are elicited and maximized by machines. There is a shift from cooperation to harmony at cutting-edge production sites, and OMRON is supporting this evolution with "automation to empower people" centering on the factory automation business.

At the same time, there are many fields and industries where not even substitution has been achieved. Think of nursing care. In a world where human skills are so important, "empowering people" is an issue of extraordinary importance. For a start, we have to ascertain what people should do and what should be left to machines. That's why at OMRON we are tackling the challenge of preventive care so that people can avoid becoming bedridden. Specifically, we are involved in projects supporting elderly care business, with IXI handling commercialization in collaboration with local governments.

It is well understood that if the signs of functional impairment are captured at an early stage before nursing care is required and improvements in exercise and lifestyle habits are encouraged, then healthy life expectancy can be extended. For that to happen, an "assessment" must first be performed to pick up and analyze lifestyle issues, the prospect of improvement, and so on, of the elderly person. However, since this not only takes time but also requires considerable expertise, it has been burdensome. OMRON set out to support assessment, subsequent formulation of a care plan, and so on, by applying AI. Based on the plan, caregivers explain to elderly care-receivers, motivate them, and provide care while communicating with them. Being told by a robot "keep trying" or "good job" without any emotion is unlikely to motivate anyone. To motivate people, human engagement is essential. Ultimately, it's work of the heart, valuable work that can only be done by people.

Whereas national finances are being strained by mounting social security costs accompanying population aging, there is also an increasingly acute shortage of staff at the medical and care-providing front lines. In the elderly care business, by organically linking people and machines, support is provided to enable people in need of care to lead self-reliant lives, which will extend healthy life expectancy. The elderly care business, which compensates for staff shortages, is a focus of high expectations from all interested parties, and OMRON concluded a partnership agreement for business verification with Oita Prefecture in July 2020, followed by one with Osaka Prefecture in April 2022.

However, when it comes to scaling up this elderly care business, staff shortages are a bottleneck. People with professional skills are needed to interact with the elderly, helping to keep them motivated, but there just aren't enough caregivers. So, recognizing that OMRON also needs to support human resources development, we are developing a training system for caregivers.

Of course, what is important is where the line is to be drawn between the role of people and the role of machines. In SINIC Theory too, there are concerns that "as technology evolves, the roles of humans may be marginalized." Hence, while we will work to design a near-future where people are empowered, we need to find the answers to such questions as: How far can systemization and automation progress before people are pushed to the margins? What should be left for machines to do? Which areas need to be activated by human creativity?

At IXI, a cluster of themes based on such perspectives are advancing to the business verification stage. New business creation cannot be achieved overnight. Neither can it be expected to make a big contribution to corporate financial performance immediately after commercialization. Nevertheless, if there is a chance for business to solve a social issue, we should rise to the challenge. The spirit of our founder is expressed by the "7:3 Principle." In other words, "if there's a 70% chance of success, be brave and give it your best shot, but at the same time always think about how to deal with the remaining 30% risk." In that spirit, we are innovating to create new businesses.

Creating a Practical Mechanism for "Job-based Employment"

—— Human resources development is the driving force of innovation. What measures is OMRON implementing in human resources development?

In pursuit of innovation, we have positioned human resources development at the heart of our mission, alongside transformation of organizations and mechanisms to innovate driven by social needs,

because talented people are indispensable for OMRON's sustainable growth. In recent years, we have made a big effort to foster "architects" capable of drafting comprehensive business plans embodying their expertise concerning markets and frontline business, technology, and intellectual property, as well as "core technology talents" with expertise in AI, robotics, and so on. At IXI, we have adopted "job-based employment" where the jobs required for project execution—those of the architects who construct the business, the specialists with high-level expertise, the team leaders, etc.—are defined and staff are allocated who possess expertise and experience commensurate with the job requirements or who are expected to develop the necessary expertise. Whereas IXI is the platform from which human resources capable of innovation flow, the Technology and Intellectual Property HQ is the platform from which engineers supporting that innovation flow. Here too, we are transitioning to job-based employment.

Although job-based employment tends to be regarded as little more than the drafting of job descriptions, its essence lies in "clarifying roles and skill levels." When applying this approach to technical staff, an inventory must first be taken of each employee's skills. For example, the field of expertise of an electrical engineer can be divided into many different areas—analog, digital, control, and so forth. After sorting this out, the next step is to evaluate the skill level in each field on a five-point scale, so that skill and job are associated. For example, this is level 1 work, whereas that is level 2 work, and so on. The requirements for each level are clear, so we can see at a glance what should be mastered to upgrade from level 2 to 3. This approach is highly beneficial in terms of employee enthusiasm and commitment.

Clearly, the company must offer educational opportunities so that employees can progress from one level to the next. In other words, you cannot create a personnel system with job-based employment without investing heavily in skills education. That is why SF 1st Stage, which we announced in March, included investment of ¥6.0 billion in human resources development over a three-year period from fiscal 2022, representing a threefold increase from conventional figures.

Attempts to introduce job descriptions were made in the past at OMRON, but did not gain traction. In light of that experience, this time we have resolved to create a practical mechanism. For example, by arranging for a team including specialists from outside the company to perform evaluation, we are not only signaling our commitment to making the necessary investment, but also investing time and being thorough in everything we do. Although a CTO who devotes this much attention to the personnel system may be unusual, it is after all people who will create the revolutionary technology and businesses and the source of innovation will always be human resources. Once we decided to do this, we must create a truly practical mechanism. That is why I have personally devoted a considerable amount of my energy to this issue.

Carbon Neutrality at Production Sites Anticipating Needs

—— At OMRON, there's a culture where it plants a flag to declare its goals and expand collaborations by inviting empathy and resonance from within and outside the company. What are some recent examples?

The capital and business alliance with JMDC Inc. announced this February to create a business through the combination of the product value perspective and the essential value perspective in the cause of "extension of healthy life expectancy," is certainly worthy of such a flag.

JMDC has a vast amount of health insurance claims and medical check-up data, and has also accumulated the technology and know-how for analyzing that data so it can be put to effective use. However, it lacks the necessary hardware. In contrast, though OMRON has the hardware and technology to collect individual vital data, we lack knowledge of the data business. This partnership will complement each other's insufficiencies while maximizing their respective strengths in pursuit of "extension of healthy life expectancy."

Moreover, this partnership will show people inside and outside OMRON the trajectory we have in mind for our nascent solution-based business offering essential value. Whereas the abstract notion of the shift from the product value perspective to the essential value perspective is difficult to convey, our partnership with JMDC will make it easier for people to understand what we are endeavoring to do. In fact, the response following the announcement has greatly exceeded our expectations.

—— What businesses from the essential value perspective are already up and running?

One example is "i-BELT," a service that makes use of data. It is a solution business in which data harvested at manufacturing sites is utilized to solve customers' issues. However, the content of that business is changing dramatically.

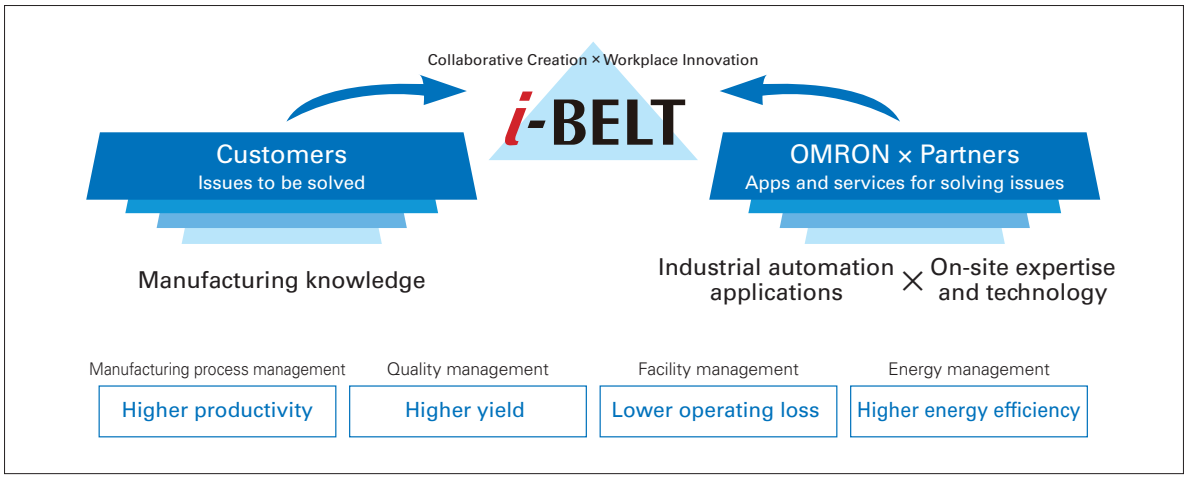
Whereas productivity and quality improvement were previously the principal objectives, now, there is a mounting interest in "making production sites carbon neutral" amid concerns about the impact of soaring energy prices and supply shortages on the

global economy. In these circumstances, visualizing CO_2 emissions at the level of a manufacturing site or a production line is necessary but insufficient. It will surely become normal to visualize CO_2 emissions for each individual product. At our Matsusaka Factory where we produce healthcare products, we are experimentally measuring the CO_2 emissions generated when producing a single blood pressure monitor.Visualization of CO_2 emissions per product is almost certain to be required in the near future in the EU, followed by other markets worldwide. Over and above this, there will of course be huge demand for the reduction of CO_2 emissions. This is a big business opportunity that the entire OMRON Group can address. Digital twin will then come into its own. This is because the use of data from various sites will make it easier for us to predict the near future in cyberspace and improve our operations.
OMRON has on-site capabilities centering on the products and knowledge accumulated in the factory automation business; the devices and modules, such as relays and switches, to achieve energy saving; and the technological and idea-proposing capabilities cultivated in the energy solutions business. The addition of data-driven AI and simulation technology will enable comprehensive solutions to various energy-related problems in production. We aim to achieve new value creation through a business from the essential value perspective unique to OMRON.

Bringing the "Autonomous Society" into Sharper Focus through Open Discussion Grounded in SINIC Theory

— And finally, according to SINIC Theory, we will be shifting to an "autonomous society." What will this autonomous society be like, and what do you think lies beyond it?

Our founder Kazuma Tateishi, while maintaining that an individual and society, people and nature, and people and machines would spontaneously harmonize in the coming autonomous society, did not offer any deeper explanation. So, mindful that our task is to dig deeper to bring the autonomous society into sharper focus, we are currently engaged in animated discussion with a view to updating the concept.
In 1970 when SINIC Theory debuted, growth meant raising efficiency and convenience to become more affluent. Therefore, diagrams indicating the structure of SINIC Theory depicted how technology, science, and society would interactively develop with a focus on the human yearning for progress. When reassessing this in today's terms, I think our orientation as human beings, the trajectory of our ideas and values, should take center stage. The feeling that wells up from the very bottom of the hearts of those of us living in this contemporary world, a symbiosis of humanity and nature, what does it mean? That is the key point.
We're asking external experts and young people, including those of Generation Z, to take part in the current discussion. In talking about the society of the future, it would be odd not to reflect the values of younger generations, neither are we going to get anywhere if discussion is limited to OMRON. So we see openness as a virtue. We want to cast our net as wide as the world.
I am eager to share with you the results of those discussions soon, fleshing out our vision of the autonomous society. With this as a model, I will strive to involve people within OMRON and beyond in the collaborative endeavor of building a future to which we can all aspire. I believe that in this way we can actually put the OMRON Principles into practice.



i-BELT: Example of a data-driven service that creates value from the essential value perspective