

CTO Message



Technology Management for Self-Driven Innovation Driven by Social Needs

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An Era Full of Opportunities for Innovation Driven by Social Needs

In its management of technology, OMRON defines social issues to be resolved and, backcasting from the desired image of society, formulates and implements business, technology, and intellectual property strategies. Since assuming the position of CTO, I have taken on the challenge of creating organizations and systems to realize “innovation driven by social needs” by drawing growth scenarios based on what I call “near-future design,” which is a concrete depiction of our desired near-future social vision. This is an attempt to continuously pursue as an organization the essence of what our founder Kazuma Tateishi, who was an outstanding engineer and manager, practiced. Two years since the start of the long-term vision “SF2030,” technology management based on backcasting from the near-future design has begun to produce various results useful for resolving the three social issues OMRON is addressing under SF2030.

Firstly, I would like to reflect a bit on the past. In the 1960s, when OMRON was poised for major growth, our founder was convinced that strengthening research and development was essential to prepare for changes in society and for addressing growing market needs. So he invested an amount equivalent to four times the company’s capital at that time to establish the Central R&D Laboratory. Then, he hired a large number of engineers to pursue development of systems and software in addition to development of components for automation such as switches and relays. The background to this was that the founder

predicted the future cashless era and believed that the technological development of systems and software would be crucial in the course of a shift toward a cashless society. OMRON thus expanded its business format from a component manufacturer to a system manufacturer and achieved dramatic growth. OMRON was able to make such a bold decision at that time because of the founder’s conviction that “management means anticipating the needs of future society” and his recognition of the necessity of practicing “R&D-driven management to create a market.”

The founder and his team then developed a theory of future prediction in order to develop a concrete vision of future society and explore business opportunities, presenting it at the International Future Research World Congress in 1970. This is the SINIC Theory. OMRON continues to position the SINIC Theory as a management compass in its initiatives for innovation driven by social needs.

According to the SINIC Theory, year 2023 corresponds to the Optimization Society and is in a transition period leading to the Autonomous Society. There were transition periods in the past. OMRON achieved dramatic growth in the period from late 1960s to the 1970s. It was the transition period from the Automation Society to the Cybernation Society. It was a time when Japan’s high economic growth led to social issues such as traffic congestion caused by the advent of motorization and congestion at train stations due to the concentration of population in urban areas. At its Central R&D Laboratory, OMRON developed a stream of world-first products and systems, such as automated traffic signals, unmanned train station systems, and online automated cash dispensers, bringing about major changes in the way people lived and worked.

The Optimization Society in which we live at present is also a transition period in which population aging and widening economic disparities are creating strains in social and economic systems, and a number of social issues have arisen due to confusion and conflict in the context of much debate concerning the sustainability of life on Earth. In the past few years, the spread of COVID-19 has brought about major changes in our values and ways of working, and the rapid evolution of AI and other digital technologies is changing our lives and our society. Generative AI is now within everyone’s reach, and the ongoing debate around the world about its use and regulation reflects this. We are in a period of great change, with technology, science, and society interacting with one another, in which there are abundant opportunities for innovation driven by social needs.

Three Approaches and Four Organizations to Self-sustaining Innovation Driven by Social Needs in the Runup to the Autonomous Society

In order to ensure that we seize the opportunities, as CTO, I have been focusing on development of organizations, mechanisms, and human resources to implement strategies based on near-future design. These tasks had to be accomplished in order to transform the tacit knowledge of technology management practiced by the founder into explicit knowledge and organizational knowledge enabling OMRON to continuously engage in innovation driven by social needs. Specifically, we have established four organizations to approach the three elements of the SINIC Theory, “science,” “technology,” and “society,” as well as interaction of these elements and upgraded our approaches. (See [Figure 1](#) and [Table 1](#))

First, we established the Innovation Exploring Initiative HQ (IXI) in 2018 for “establishment of a business creation process,” an approach whose starting point is “society.” As a platform for the OMRON Group’s innovation, IXI is committed to the ongoing creation of new businesses. In the same year, we also established OMRON SINIC X Corporation (OSX) for “core technology evolution,” an approach that takes “science” and “technology” as its starting points. OSX is responsible for the creation of innovative technologies through open innovation from a broad “scientific” perspective based on a vision of society in the near future. The Technology and Intellectual Property HQ, which is responsible for social implementation of technology, has defined focus domains and directions for strengthening development of core technologies, and reviewed development themes in close cooperation with IXI,

Figure 1

<Relationships between the SINIC Theory and the Organizations>

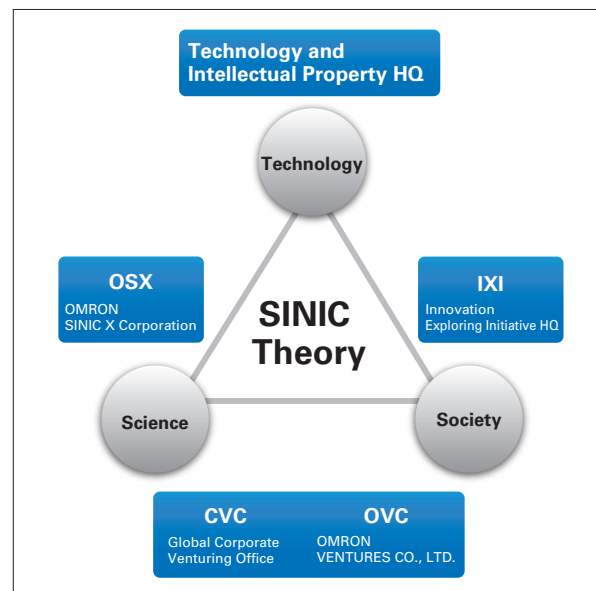


Table 1

<Three approaches to social needs creation by four organizations>

<p>Approach 1: Establishment of a business creation process: IXI</p> <ul style="list-style-type: none"> ● Company-wide platform for management commitment to new business creation and business development ● Implement the founder’s “7:3 Principle” as a business creation process ● Classify the types of human resources needed for new businesses, attract such talented people from inside and outside OMRON, foster them, and return them to the organizations from which they come
<p>Approach 2: Evolution of core technologies: Technology and Intellectual Property HQ, OSX</p> <ul style="list-style-type: none"> ● Identify areas of technological focus and strengthen “Sensing & Control +Think” ● Develop technologies for “substitution,” “collaboration,” and “harmony” to achieve social implementation of “automation to empower people.” ● Attract talent through creation and dissemination of innovative technologies from a scientific perspective based on near-future design and co-create ● Formulate a policy for utilization of intangible assets company-wide and implement IP strategy
<p>Approach 3: Co-creation with startups: CVC, OVC</p> <ul style="list-style-type: none"> ● Invest in promising startups with high growth potential that address social issues ● Co-create with business divisions, IXI, Technology and Intellectual Property HQ, and startups for creation of new markets and business innovation ● Implement the acceleration program to quicken business growth through involvement in the startups in which OMRON invests

business divisions, and OSX. The third approach, “co-creation with startups,” which takes “science” and “society” as its starting points, is carried out by OMRON VENTURES CO., LTD. (OVC) and the Global Corporate Venturing Office (CVC). OVC and CVC are taking on the challenge of pioneering social implementation of cutting-edge technologies, and are working to accelerate open innovation through investment in and co-creation with startups to create innovation driven by social needs.

Human Resources Development to Create Innovation Driven by Social Needs

Human resources are the key to these initiatives to create innovation driven by social needs through near-future design. I have been paying particular attention to the development of human resources capable of continuously creating innovation driven by social needs. Having classified the types of human resources needed in the business creation process, IXI has focused on fostering “architects” capable of drafting comprehensive business plans (architecture) linking business, technology, and intellectual property. Architects fostered at IXI have returned to business divisions, the Technology and Intellectual Property HQ, etc., to lead new businesses and strategies, or have been dispatched to government agencies, etc., to support their digital transformation (DX). The Technology and Intellectual Property HQ, a source of “core technology talents,” established a specialist system for engineers, defined skill levels, and launched a training system ahead of the rest of the OMRON Group, creating an environment where all employees can fully demonstrate their abilities.

New Social Needs for Resolution of Social Issues

Eight years since the start of technology management based on near-future design, I am sensing that innovation driven by social needs is becoming self-sustaining. This is because the four organizations,

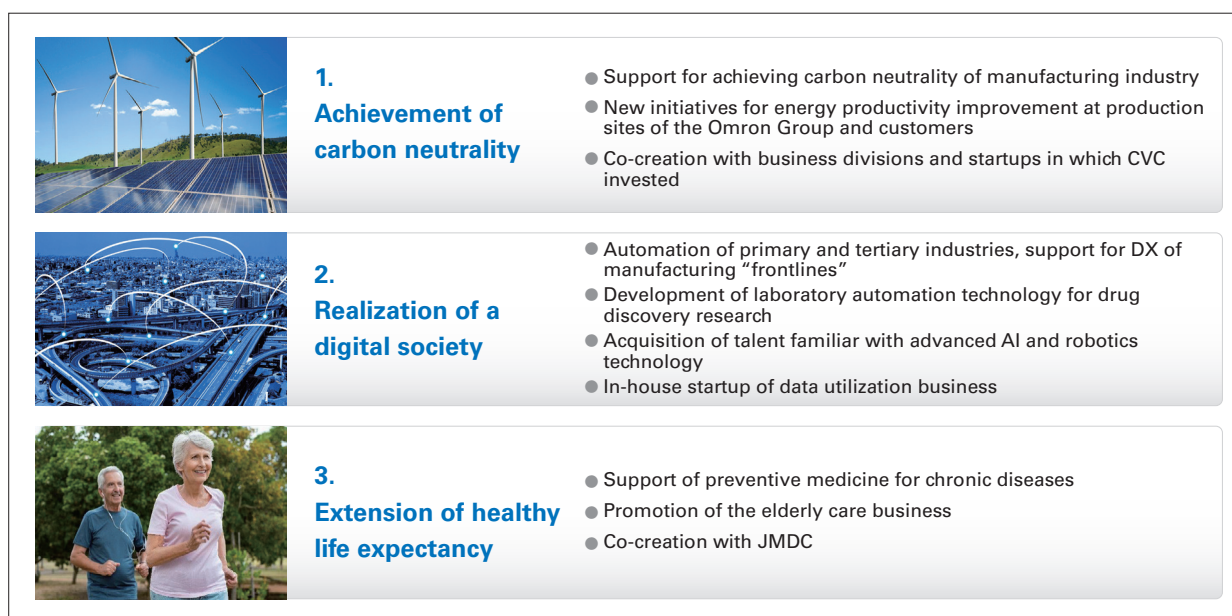
three approaches, and human resources implementing the near-future design are beginning to produce results, such as new businesses and development of core technologies, in the focus domains to resolve the three social issues defined under SF2030. (See [Figure 2](#))

For “achievement of carbon neutrality,” our near-future vision is to achieve carbon neutrality of manufacturing sites and entire factories. In addition to the development of products and systems, and services in the business divisions and the Technology and Intellectual Property HQ, co-creation with startups in which OMRON has invested has also begun. Attempts are underway to quickly link the latest technologies possessed by startups to social implementation.

With regard to “realization of a digital society,”

adoption of our services to support utilization of data at manufacturing sites is widening, especially by small and medium-sized companies whose manufacturing sites have impeded promotion of DX in manufacturing industry. From the current fiscal year, OMRON’s first in-house startup to emerge from IXI has begun full-scale business activities for these data utilization support services. The Technology and Intellectual Property HQ and its research subsidiary OSX are developing AI and robots that assist people and enhance their potential and creativity, with the aim of realizing a “people-centric society” in which everyone can play an active role through the use of AI and robots, in addition to data utilization. The joint research with Chugai Pharmaceutical Co., Ltd. in the field of drug discovery, which began in July 2023, is an attempt to create “innovative technology to evolve the

Figure 2 <Focus Domains for Innovation Driven by Social Needs and Achievements>



relationship between humans and machines” toward realization of the Autonomous Society, and will trigger innovation in the field of drug discovery research. In addition, OSX brings together world-class researchers in the AI and robotics fields who have been inspired by OMRON’s vision. Through open innovation, they are developing unique advanced technologies that will contribute to the realization of the Autonomous Society. More than 40 papers have been presented by OSX and accepted for publication at prestigious international conferences, indicating our technological capabilities for development of AI and robotics. Nowadays, OSX is visited by people from many research institutes and different industries, and many co-creation themes are proposed to OSX. Regarding data-driven healthcare for “extension of healthy life expectancy,” IXI is promoting development of a new business. As population aging accelerates and various issues related to nursing care emerge, a service to support the independence of the elderly, which focuses on “preventing nursing care itself” rather than supporting nursing care, is in the final stages of verification for commercialization. In addition, as we enter the era of 100-year life expectancy and the need for a society in which people can continue to work in good health, issues such as the financial soundness of corporate health insurance associations and the curbing of ever-increasing medical expenses are becoming more pressing. In order to concretize a future vision of data-driven healthcare that will resolve such social issues, IXI has taken the lead in various co-creation projects to create new value in the healthcare solution field with JMDC, with which OMRON entered into a capital and business alliance in March 2022, and is accelerating digital transformation of the OMRON Group. Going forward, as well as making JMDC a consolidated subsidiary*, OMRON plans to develop IXI into a new organization, the Data Solution Business HQ, so as to apply JMDC’s capabilities throughout the OMRON

Group. The Data Solution Business HQ will directly report to the President and CEO. These moves are proof that OMRON is beginning to demonstrate its ability to create innovation driven by social needs in the transition period to the Optimization Society. OMRON’s founder advocated that “To the machine, the work of the machine, to man the thrill of further creation” Inspired by the OMRON Principles and this management philosophy bequeathed by our founder, we are always thinking about a near future in which people can become more creative and fulfill their potential. OMRON is able to take on the challenge of creating innovation driven by social needs because everyone involved, including our employees, sympathize and resonate with this idea. This allows us to continue to advance vigorously as an autonomous organization, bringing together leaders and engineers from around the world who are passionate about resolving social issues by applying their capabilities and shaping the future.

* As of this writing (September 15, 2023), the tender offer to make JMDC a consolidated subsidiary has not yet closed. The share acquisition is scheduled to be executed on October 16, 2023.

Capturing the Tide of Discontinuous Technological Innovation and Creating Innovation Driven by Social Needs

In this way, I have been implementing technology management that anticipates the needs of future society and promotes R&D-driven market creation, as our founder did, through creation of organizations and structures and human resources development, but many issues remain to be addressed. Specifically, in order to realize innovation driven by social needs in a period of great change as we progress toward the Autonomous Society, we need to “search for the seeds that will become themes,” which are essential to the implementation of near-future design, “gain insight into technological innovations taking place around the world,” and “further strengthen the human resources” who will engage in these initiatives.

This is because the degree of change in all areas of society, science, and technology is greater and more complex today than it was when the founder and his team were striving to create innovation driven by social needs. Not only the rapid spread of generative AI since the beginning of 2023, but also materials science that produces innovative new materials, quantum computers that exceed the performance limits of conventional computers, and biotechnology such as genome editing and regenerative medicine, could potentially have a tremendous impact on society and transform people’s lives. In the course of implementing these technologies in society, various issues, such as those related to ethics and economic rationality arise, and the new technologies are disruptive because they do not fit existing social systems and values. In order to capture the tide of discontinuous technological innovation, continuously create new businesses and innovations, and achieve sustainable growth, it is not sufficient to simply envision a future society in which technology has become diffused. For bringing the future society into sharper focus, defining specific issues, and resolving them, an individualistic approach will not work. It is necessary to collaborate with organizations and individuals worldwide at the forefront of every field in order to envision a society we aspire. We also require human resources capable of grasping the ebb and flow of society, science, and technology, and of finding the seeds that emerge and cultivating them one after another. As CTO, I will continue to achieve “value-up” of our technology management while endeavoring to enhance each employee’s ability to create innovation driven by social needs in pursuit of sustainable growth. I will take on the challenge of realizing “automation to empower people” for the benefit of the new society, the Autonomous Society embodying the management philosophy of our founder, working together with our diverse stakeholders.