Technology and Intellectual Property HQ

Challenge to Create Social Needs with Innovative Technologies

Strengthening Core Technologies for "Empowering People through Automation"

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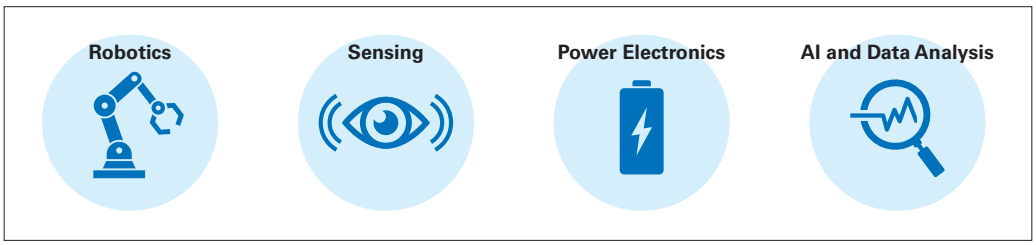
In order to resolve various social issues, OMRON has been refining the sensing technology for acquiring on-site data and the control technology for appropriate feedback. As indicated by the addition of "Think," signifying human wisdom, to the combination of "Sensing & Control" in 2011, we have been continuing to strengthen our core technologies defined as "Sensing & Control + Think." New technologies OMRON has created in recent years, which will lead to new value creation, include: "3D vision sensors" serving as the eyes of robots performing simple tasks previously performed by humans; "visual inspection equipment" whose ability to detect small scratches or stains on a product, and to make related judgments, is equal to that of skilled workers; and "AI controllers" capable of anomaly detection of production equipment.

During the VG2.0 period, amid accelerating technological development, we enhanced our ability to draw "technological architecture," an overview of the technologies necessary for social implementation, by backcasting from a near-future where the social issues have been resolved, rather than viewing the near-future as an extension from the past. At the outset of SF2030, we designed a near-future by "empowering people through automation," started examining "technological architecture" by redefining "relationships between people and machines," and determined the technological issues to be addressed by OMRON.

Adopting a panoramic view of the technological issues, we identified four areas of OMRON's technological focus and reorganized the technological development structure in April 2022. These four areas are: "Robotics" representing the body of a machine, "Sensing" being its five senses, "Power Electronics" being its power source, and "AI and Data Analysis" that are its intelligence.

Areas of Technological Focus



Taking robotics as an example, the declining birthrate combined with population aging and a shortage of skilled workers are fueling greater utilization of robots. However, at present, utilizing robots requires a high level of expertise, and moreover, the tasks robots can perform are limited, and so people have to work alongside robots. OMRON started by rethinking how robots should be used "to empower people." Our aim is for robots to perform exhausting and dangerous tasks that currently have to be done by people as well as mechanical repetitive tasks. For this purpose, having overhauled the hardware and software for robots, we are developing new robots. To tackle this new challenge, OMRON SINIC X Corporation is vigorously proceeding with the development of innovative technology through collaborative creation and R&D with universities, business enterprises, and other external parties from the viewpoint of medium- to long-term technological development.

Strengthening Technical Human Resources and Intellectual Property Initiatives

To refine our core technologies and create new value through technological innovation, an important element is of course technical human resources. Amid unceasing technological evolution typified by AI and robotics, in order to foster engineers capable of working effectively both inside and outside OMRON, we clearly defined the technological fields required for OMRON's growth and the types and levels of skills required, as well as roles and responsibilities and started a new initiative for technical human resources development in fiscal 2021. We also support upskilling with respect to various technologies, such as by providing opportunities to learn the latest technologies from the basics.

Moreover, intellectual property, which is one of our non-financial values, is becoming ever more important in the context of our ongoing efforts to create new value. At OMRON, "using intellectual property to continue creating new value leading to sustainable growth" is the policy informing all our IP initiatives, which are undertaken based on a clearly defined mission and vision. In addition to obtaining rights for our company's unique technology and strengthening the exercise of rights to utilize that technology, we draw up multiple scenarios to realize our near-future design as "intellectual property architecture" and file applications in advance for innovation driven by social needs. In doing so, we are strengthening IP initiatives to deliver unique OMRON value.

Patent application training

OMRON Intellectual Property Center Mission

We deliver unique value for people around the world by leveraging our core assets of intellectual property.

We develop and deepen appealing ideas.
We deliver peace of mind and confidence to customers.
We enhance our presence to our competitors offensively and defensively.

OMRON Intellectual Property Center Vision

We bring the IP specialists together from diverse fields and continue to create innovation.

We defy stereotypes.
We create a new paradigm of connections.
We strive to increase the trust from the management team.

During the VG2020 period, we provided education on patent applications to all the engineers in the OMRON Group and strengthened our ability to create patents. As a result, the number of patents in OMRON's possession in fiscal 2021 was 12,061, more than double the 5,959 in fiscal 2011. OMRON has been publishing a journal of technical papers entitled "OMRON TECHNICS" since 1961. The purpose is to contribute to a better society by providing the public with access to the R&D outcomes of the OMRON Group engineers for resolving social issues. OMRON has been selected by Clarivate as one of the Top 100 Global Innovators for the sixth consecutive year. We view this as recognition of our IP initiatives in terms of the volume of patent applications and breadth of technologies.

We got off to a great start under SF2030 by enhancing non-financial value in two key respects: strengthening our technological development abilities to link new value to social implementation and strengthening human resources development and IP initiatives. To create value to resolve social issues by "empowering people through automation," we will further strengthen and refine our core technologies of "Sensing & Control + Think." https://www.omron.com/global/en/technology/#

Case

Development of People-centric Flexible Robot that Adapts to People

As the working population continues to shrink due to a declining birthrate and population aging, we are emphasizing development of robots for empowering people. OMRON SINIC X Corporation, which is in charge of R&D based on backcasting from a near-future design, is conducting advanced research from a medium- to long-term perspective, utilizing collaborative creation with universities.

Case: Realizing Robot Operations Instigated by Verbal Instruction

Until now, for robots to operate in various on-site settings, specialist knowledge for handling the robots is essential. As a way to enable anyone to easily handle a robot, technology enabling operations of a robot by verbal instructions is a focus of rising expectations. Using the technology that we are working on, people would only need to give verbal instructions to a robot and the robot would understand the action to be taken automatically and perform the task. With a view to realizing this technology, OMRON commenced a joint research project with Kyoto University, Tokyo Institute of Technology, and Nara Institute of Science and Technology, in fiscal 2021. In connection with this research, our paper was accepted and presented at "ACM* Multimedia 2021," a major international conference in the multimedia field.

*ACM: Association for Computing Machinery