

R&D, Intellectual Property, and Standardization

Next Innovation Creation



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The Company focuses on AI, next-generation communications, and EV as new industries, accelerating the creation of next innovation from the two perspectives of enhancing our added value by strengthening technological capabilities and expanding business areas. We will accelerate the development of people- and society-oriented AI, leveraging our unique Edge AI technology CE-LLM^{*1}, as well as next-generation communication technologies, which are expected to grow in importance. In addition, we view mobility as a way of life, embracing the challenge of creating unique value for Sharp.

We introduced the Innovation Accelerator Project (I-Pro), a company-wide project led by the CEO to accelerate these efforts. We identify promising themes that resonate throughout the Company, aiming for the early launch of new innovative businesses by combining the collective strength of the Sharp Group.

We also established the SHARP INCUBATION HUB, a site to control incubation activities. As part of our efforts, we launched the SHARP Co-Creation PROGRAM, which combines our strengths and co-creation ideas based on business ideas from a wide range of partners, including startups and creators, to create new solutions focused on customer issues.

^{*1} CE-LLM (Communication Edge-LLM) is a registered trademark of Sharp Corporation.

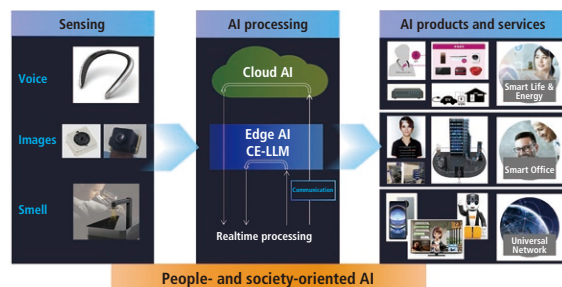
For more information on Next Innovation Creation,
see **New Industry Directions and Outlooks under the Message from the President** on P.6

R&D Initiatives and Directions of Technological Developments

The Corporate Research & Development Group is committed to building new ecosystems using the world's first and best unique technologies impacting society. To this end, the group is committed to its mission of helping to achieve a sustainable society through the creation and expansion of new businesses.

Collaborating as One SHARP, we accelerate new business development in growth areas that establish more comfortable living environments. These areas include strengthening initiatives toward carbon neutrality and advancing digital transformation in infrastructure.

We focus particularly on creating innovations friendly to people and the earth through the application and development of advancing AI technologies.



Direction of Technological Developments at Sharp
- Implementing Edge AI technologies <CE-LLM> in all businesses -

Intellectual Property Strategy

Sharp positions its intellectual property strategy as one of the most important management strategies, pursuing it together with business and R&D strategies. We work to enhance our business advantage and strengthen our management foundation by actively obtaining patents. We also spun off the Intellectual Property Department and established Sharp IP Infinity Co., Ltd., aiming to make the department a profit center. Sharp IP Infinity has thorough knowledge of Sharp products, technologies, and businesses. Utilizing this knowledge, the company will provide advanced services as the company enforces improvements in the quality and efficiency of professional services. In doing so, Sharp IP Infinity will enhance the driving force of intellectual property management and generate strong patents and various economic values with the advanced technologies of Sharp. In regard to patent acquisition, Sharp clarifies the core technological fields for each of our businesses and works closely with the field to make strategic patent applications.

We also actively work to obtain useful patents generated through alliances with other companies or industry-academia collaborations.

Standardization Strategy

In recent years, standardization activities have become increasingly important as a tool for corporate management strategies, such as strategies to create markets and secure competitive advantages. At the same time, there is an urgent need in Japan to strengthen competitiveness by acquiring international standards.

In 2003, we established a research institute to acquire patents for wireless communication technology standards and participated in the standardization of LTE launched at the 3GPP^{*2} meeting in 2004. Since then, we have continued to participate up through the standardization of Beyond 5G. Our stock of over 7,500 communication standard essential patents in more than 50 countries around the world serves as an important management resource to the Company.

Furthermore, we actively engage in international collaborations with overseas companies and universities, focused on pursuing international standardization of next-generation communication and video coding technologies in particular. We also actively send young employees to international conferences to gain various experiences, aiming to develop highly skilled human resources.

<Contributions>

Contributed to formulating the 5G-Advanced standard specifications

Contributed to the development of the world's first physical layer standard specification for 5G-Advanced, which aims to expand the functionality and improve the performance of 5G (5G-Advanced is expected to be put into practical use in the late 2020s.)

<Awards>

Three employees received 2024 TTC Distinguished Service Award

Awarded in recognition of achievements related to 3GPP workshop initiatives leading to the development of young standardization personnel

^{*2} 3GPP (Third Generation Partnership Project) is a project to study and develop specifications for mobile communication systems dealing with 4G (4th generation mobile communication systems) and 5G (5th generation mobile communication systems) technologies. The developed specifications have been widely adopted for mobile communication systems in Japan and around the world.