## Conclusion

As introduced in each chapter, the rapid development of AI technology and emergence of services with interfaces that allow use by nonexperts have expanded the possibilities for the utilization of advanced AI technology in our daily lives, business, R&D, etc., and they are bringing changes to science, technology, and innovation themselves.

In Japan, AI R&D is advanced at universities and companies, etc., while making the most of the strengths cultivated in fields such as manufacturing and robotics. However, amidst the intensification of international competition, there are a mountain of issues, such as securing human resources, research funds, and computing resources.

Looking at the situations in other countries/regions, universities and private companies are accelerating R&D with, for example, the United States making the most of its strengths of technological innovation and venture capital ecosystem, and China making the most of its strengths of a large amount of data and State-led strategic investments. Europe demonstrates leadership in the regulatory aspect, due to its strong awareness of personal privacy and data protection.

Against this background, what would be the key to science, technology, and innovation policies in order for Japan to strengthen its international competitiveness and to realize the society that Japan should aim for (Society 5.0), by harnessing AI that has entered a new era?

The key could include, for example, the following: sustainable investments in development of cutting-edge technologies and human resource development, including use of AI in fields in which Japan has strengths, such as robotics and automobiles; strengthening collaborations among top-level researchers inside and outside Japan; and building a framework for dealing with ethical and social problems. As introduced in Chapter 4, "AI for Science" initiatives have started to be implemented in various research fields, and international competition is also accelerating. Therefore, it is important to support Japanese researchers and research institutions, etc. that attempt to achieve a new paradigm shift in science.

In addition, as discussed in Chapter 1, AI technology has advanced while repeating booms several times, but the speed of advancement particularly in the last few years has been unprecedentedly fast. The "AI Strategy 2022" released in April 2022 did not mention initiatives, etc. that anticipated the rapid advancement of generative AI technology. It was not until the following year that discussions on public and private investments, initiatives, and response to risks accelerated, which was after developments such as the release of OpenAI's ChatGPT in November 2022 attracted attention. It can be said that it is becoming increasingly important to strengthen strategic and flexible governance functions, such as sensitively identifying the signs and trends of cutting-edge science and technology and analyzing the risks and impacts, including the "AI for Science" initiatives discussed in Chapter 4.

As seen in Chapter 5, empirical research has also started for utilization of advanced AI technology in various industries and business types, including the public sector and the manufacturing industry. While the utilization of AI technology is hoped to contribute to improving the productivity amidst the progress of an aging society with a declining birthrate, various analyses are being conducted on its impact, etc. on the job market. In order to truly realize coexistence with AI, it will also be essential to not be used by AI technology, but to use AI technology, to understand the issues and limits of AI technology, and to push forward changes in environments, systems, culture, etc. of AI technology, aiming to achieve a society that enables each and every individual to realize diverse forms of well-being.

We need to continue to pursue innovation so as to be able to make the changes in science, technology, and innovation themselves to be brought about by AI technology lead to realization of the society that Japan aims for, toward a new era.