

News Release

FOR IMMEDIATE RELEASE

Sompo Japan Insurance Begins Using Quantum Inspired Computer in Insurance Underwriting Operations

Tokyo, March 29, 2022 – Sompo Holdings, Inc. (TSE: 8630), Sompo Japan Insurance Inc., Sompo Risk Management Inc. and Hitachi, Ltd. (TSE: 6501) today announced that they reached an agreement on the practical use of CMOS Annealing^{*1} in Sompo Japan Insurance's non-life insurance operations. CMOS Annealing is a technology developed by Hitachi for simulating the behavior of quantum computers. It is the first case of a quantum inspired computer being used practically in the core operations of an insurance company.^{*2}

In the future, the four companies will implement the digital transformation of non-life insurance operations using CMOS Annealing. They will also combine their various data with technologies to accelerate collaborative creation activities for creating providing new social value.

1. Background

In recent years, quantum computing and quantum inspired computing technologies^{*3} have been increasingly attracting international attention. In the United States, Europe, China and other countries, they are seen as a source of innovative technologies that will bring about a major transformation of the economy and society in the future. Research and development investments are increasing substantially and strategic efforts are accelerating such as the construction of development bases and personnel development. In Japan, a number of study groups were established to enable the government to collaborate with the private sector. Nationwide efforts are being made towards the implementation of quantum computing and quantum inspired computing technologies in society.

2. Scope of application

Through repeated verification^{*4} of the feasibility of using CMOS Annealing technology in insurance underwriting operations, the four companies have been focused on modeling complicated conditions in practical operations, implementation in actual operation, and solutions to problems experienced in business. As a result, they have developed a method for extracting conditions to balance risk-taking and stable revenue from a huge number of possible combinations by utilizing Sompo Risk's natural disaster risk quantification technology and Hitachi's CMOS Annealing. In this method, conditions that need to be considered in practice are precisely modeled for the portfolio of natural disaster risks that Sompo Japan Insurance underwrites for customers. Conditions that are taken into account here include, for example, risks that Sompo Japan Insurance should retain, other risks that should be transferred via reinsurance to outside organizations, and conditions for the external transfer of risks (reinsurance conditions). As part of this effort, Hitachi has achieved new technological innovation in CMOS Annealing, enabling Sompo Japan Insurance to handle the large and complicated problem of optimizing their non-life insurance portfolio, which is necessary at a practical level.^{*5} It is expected that the practical use of CMOS Annealing will begin in April 2022 in non-life insurance underwriting operations.

3. Division of roles among the four companies

Company name	Role
Sompo Holdings	Overall control of verification
Sompo Japan Insurance	Identification of business requirements and implementation of the technology in practical operations
Sompo Risk Management	Formulation of business requirements and quantification of risks using the natural disaster model
Hitachi	Formulation of the Ising model and optimization using CMOS Annealing

4. Future developments

The four companies will continue to research the development of the technology and its implementation in underwriting operations to expand the scope of application.

In addition, they will implement digital transformation using quantum technologies not only in underwriting operations but in many other non-life insurance operations. They will connect solutions that they have strengths in, such as the real data, risk quantification technology and insurance functions of the Sompo Group and Hitachi's Lumada^{*6} digital solutions. Doing this, they will accelerate collaborative creation activities to provide new value to society with a view toward the realization of a safe, secure and healthy society.

*1 A new type of computer developed by Hitachi to solve combinatorial optimization problems using the Ising model, devised to explain the properties of magnetic materials

*2 According to the survey of the four companies

*3 Technologies for manufacturing quantum computers and quantum inspired computers to solve problems that cannot be easily solved using conventional computers

*4 News release on January 8, 2020: Sompo Japan Nipponkoa Insurance, Sompo Risk Management and Hitachi Start Demonstration Experiment on Non-Life Insurance Portfolio Optimization Using New Semiconductor-Based Computers

*5 The upgrade of the processing method succeeded in solving large problems which required 22 million spins to solve, and which could not be solved using conventional CMOS Annealing due to spin limits. This paved the way for the solving of larger problems without changing the current configuration or adding hardware.

*6 Lumada: The name of Hitachi's advanced digital solutions and services for turning data into insights that drive digital transformation of social infrastructure.

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About Hitachi, Ltd.

Hitachi, Ltd. (TSE: 6501), headquartered in Tokyo, Japan, contributes to a sustainable society with a higher quality of life by driving innovation through data and technology as the Social Innovation Business. Hitachi is focused on strengthening its contribution to the Environment, the Resilience of business and social infrastructure as well as comprehensive programs to enhance Security & Safety. Hitachi resolves the issues faced by customers and society across six domains: IT, Energy, Mobility, Industry, Smart Life and Automotive Systems through its proprietary Lumada solutions. The company's consolidated revenues for fiscal year 2020 (ended March 31, 2021) totaled 8,729.1 billion yen (\$78.6 billion), with 871 consolidated subsidiaries and approximately 350,000 employees worldwide. For more information on Hitachi, please visit the company's website at <https://www.hitachi.com>.

Information contained in this news release is current as of the date of the press announcement, but may be subject to change without prior notice.
