

# News Release

FOR IMMEDIATE RELEASE

## **Test for Verification with Quantum-Related Technology Succeeded in Reducing Work Shift Creation Time by More Than 50%**

**Tokyo, August 26, 2022** – KDDI Evolva, Inc., KDDI Corporation (TSE: 9433) and Hitachi, Ltd. (TSE:6501) conducted a verification test for applying the work shift, which had been automatically generated using quantum computing-related technology\*<sup>1</sup>, for staff members at au's message support service in the contact center to actual operations in July 2022 (hereinafter the "Verification Test").

The Verification Test confirmed that time which an administrator spends for creating a work shift was reduced by more than 50%. In addition, according to a survey conducted after application to actual operations, more than 90% of the staff members responded positively with respect to the automatic creation of a work shift. The three companies are working towards putting the shift creation using quantum-related technology into practical use in 2023 and beyond.

The creation of a work shift requires a great deal of time because it needs to satisfy complicated conditions such as staff members' contract conditions, working conditions including desired jobs and skill requirements, as well as the adjustment of the required number of staff for each time frame.

At KDDI Evolva, a company that operates business process outsourcing with the contact center service as its mainstay business, an administrator who specialized in the creation of a work shift had traditionally been creating a work shift by hand, based on more than 20 working conditions such as desired jobs and an even distribution of skills, among other factors. Even an administrator who was experienced in creating a work shift involving approximately 100 staff members had spent at least 11 hours to do that, because it was necessary to take into account a range of factors such as allocating the required number of staff members for each working day and time frame according to skill levels.

The required number of staff can be adjusted even with standard work shift creation tools. However, if working conditions are not fully satisfied, corrections need to be made by hand, which results in an increase in labor. In the experiment of a standard work shift creation tool, when using this tool to create a work shift involving approximately 100 persons, it was found that it took 20 hours, including time for corrective work and adjustments with staff members. Another problem was that the work shift was not understood by staff members who felt it was unfair because it was biased toward the working hours of specific staff members.

In response, the three companies implemented the Verification Test to solve these problems and improve work efficiency.

KDDI, in cooperation with KDDI Research, Inc., has been researching calculation methods to create a work shift by utilizing quantum computing-related technologies. Hitachi provided a work shift optimization solution\*<sup>2</sup> that uses the CMOS Annealing\*<sup>3</sup>, Hitachi's original calculation technology modeled after quantum computing. KDDI and Hitachi have been discussing and working on collaborative creation with respect to the details of the Verification Test by sharing knowledge related to the two companies' quantum computing-related technologies and ensure levels that can be applied to actual operations.

In the Verification Test, a work shift for one month of operations involving approximately 100 staff members of KDDI Evolva at facilities in the Hokkaido area was created. It was completed in approximately 5 hours, including the time to prepare data related to working conditions and to make final adjustments with staff members. Furthermore, in the Verification Test, it was possible not only to reduce the labor required for the creation of a work shift but to create one

not biased to any specific staff, thanks to quantum computing-related technologies.

KDDI Evolva, KDDI and Hitachi will aim to find practical application for the creation of a work shift by utilizing quantum computing-related technologies with a view to reducing the workload of shift creation work and improving the working efficiency of staff members.

\*1 A scheme for calculating a combinatorial optimization problem by expressing it as QUBO (Quadratic Unconstrained Binary Optimization) and using an Ising machine (a technology used to solve optimization problems) including a quantum computer.

\*2 One of the Lumada solutions - Lumada is the name of Hitachi's advanced digital solutions and services for turning data into insights that drive digital transformation of social infrastructure.

\*3 A Hitachi-developed technology in which the role of the Ising model is simulated in semiconductors without using quanta. It is able to solve combinatorial optimization problems efficiently.

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