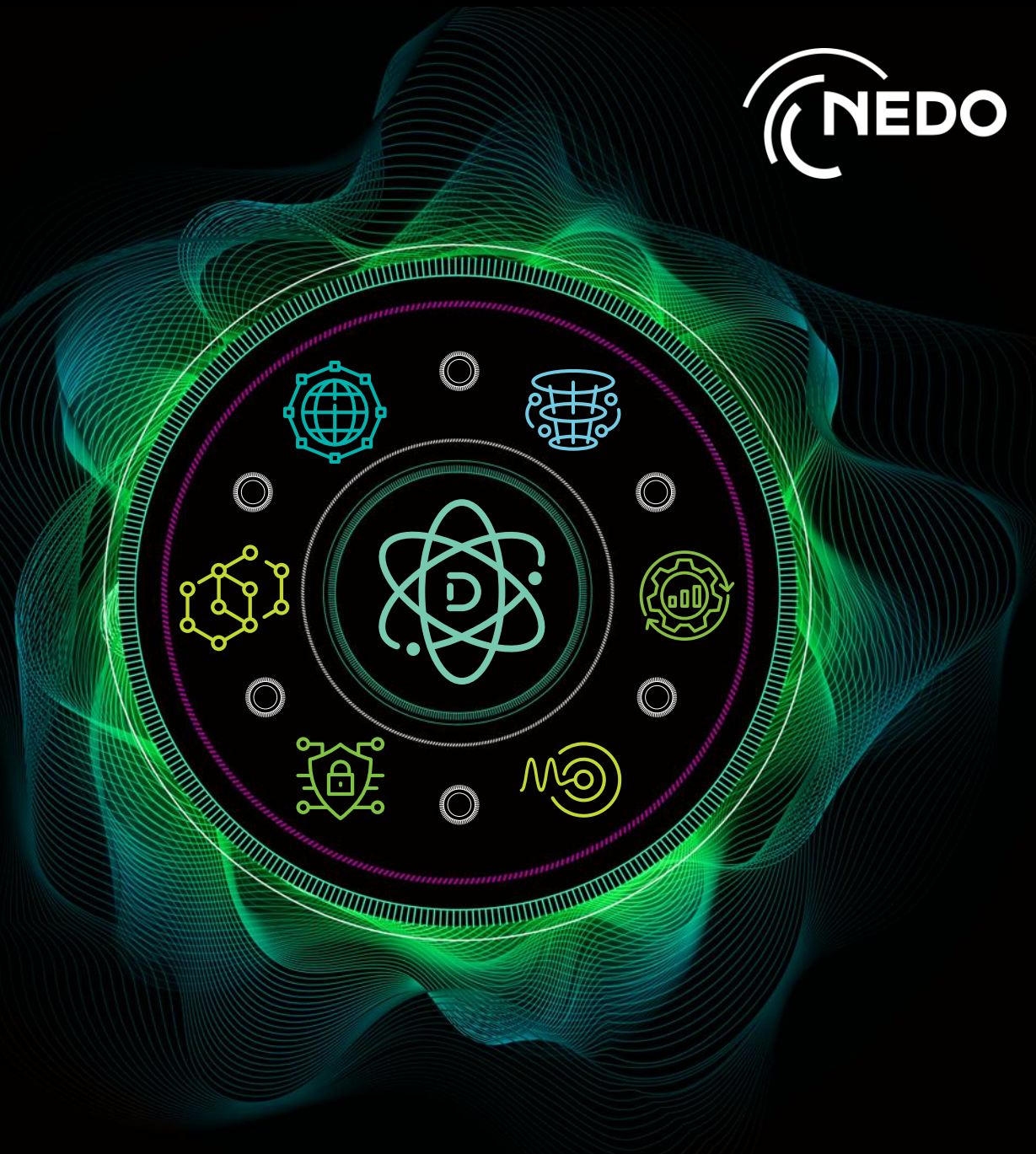
Quantum Computing Use Cases

Delivery to multiple areas by sharing trucks among multiple stores

Quanmatic, CAINZ



New Energy and Industrial Technology Development Organization (NEDO)

Quanmatic, CAINZ:
Delivery to multiple areas by sharing trucks among multiple stores [2025/12] 1/2

Operational Use

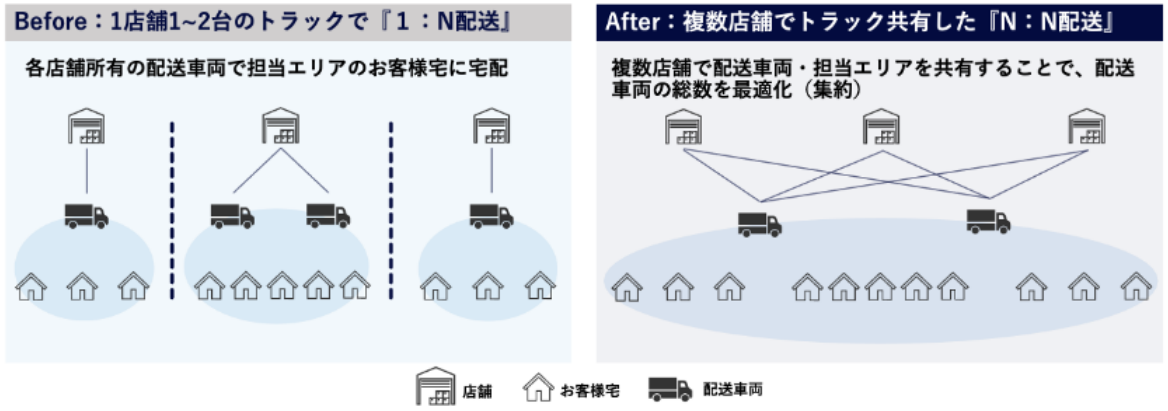
Industry	Transportation
Means	Transportation of Goods _ Land Transport
Method	combinatorial optimization
Category	–

Background

- In recent years, the importance of logistics has increased as an infrastructure that supports society, but there are a variety of issues
  - ✓ Driver shortage, traffic congestion, increased CO2 emissions, etc.
- CAINZ Otaribin is a delivery service launched by CINZ in 2022. Its highly convenient system of delivering products purchased in stores to customers' homes within the same day at the earliest has been well received by customers. In 2024, the number of deliveries exceeded 20,000 a year.

Issues and motivation to be solved

- With the expansion of the CAINZ Ohappin service, delivery targets have been expanded to include stores with a small number of deliveries.
- In order to share trucks among multiple stores and deliver to multiple areas, **We would like to implement efficient delivery by designing flexible delivery routes.**
  - ➢ **Optimal delivery route calculation using quantum computation**



Real-time planning image of delivery route using quantum computing technology

Reference: QUANMATIC"Quanmatic brings quantum computing to CAINZ" (https://quanmatic.com/news/quanmatic-cainz-quantum-delivery/)

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Delivery to multiple areas by sharing trucks among multiple stores [2025/12] 2/2

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Problem setting as a quantum computer

- **To address these complex computational challenges, Quanmatic and CAINZ have jointly developed a 'dynamic delivery system' with algorithms based on quantum computing technology.**
- Using algorithms based on quantum computing technology, **the optimal delivery route is planned in real time according to the demand of multiple stores**.

Expected business benefits

- As of November 2025, the introduction of this system in July 2025 **made it possible to optimize the required number of vehicles from 21 to 15 while maintaining service quality, and improved delivery efficiency by approximately 30%**.
- By adopting a joint delivery model in which vehicles are shared among multiple stores in the vicinity, it is possible to plan an optimal delivery route in real time according to the delivery demand of each store, thereby improving delivery efficiency.

Reference: QUANMATIC"Quanmatic brings quantum computing to CAINZ" (https://quanmatic.com/news/quanmatic-cainz-quantum-delivery/)

More use cases are available on our website. We invite you to explore them.
https://www.quantum-computing-use-cases.nedo.go.jp/english/

More Use Cases

New Energy and Industrial Technology Development Organization (NEDO)
AI and Robotics Department (e-mail: quantum_ai@ml.nedo.go.jp)

This collection of use cases was obtained as a result of the work commissioned by the New Energy and Industrial Technology Development Organization (NEDO) "Cyber-Physical Development Business of Quantum/Classical Hybrid Technology/Study of Use Case of Quantum Technology" and the "Post-5G Information and Communications System Infrastructure Reinforcement R & D Project (Quantum Industrialization)/Comprehensive Study for Promoting the Industrialization of Quantum Computers".