

Technology 03

Platform in the Age of the Digital Twin



Platform that accelerates the resolution of the social optimization problems

To achieve accurate and fair optimization

Time to solve the optimization problems

Find the best solution from a massive number of candidates within a realistic timeframe

Real-time optimization

Concise description of conditions

Enable processing of composite real-world problems by the optimal computing machine

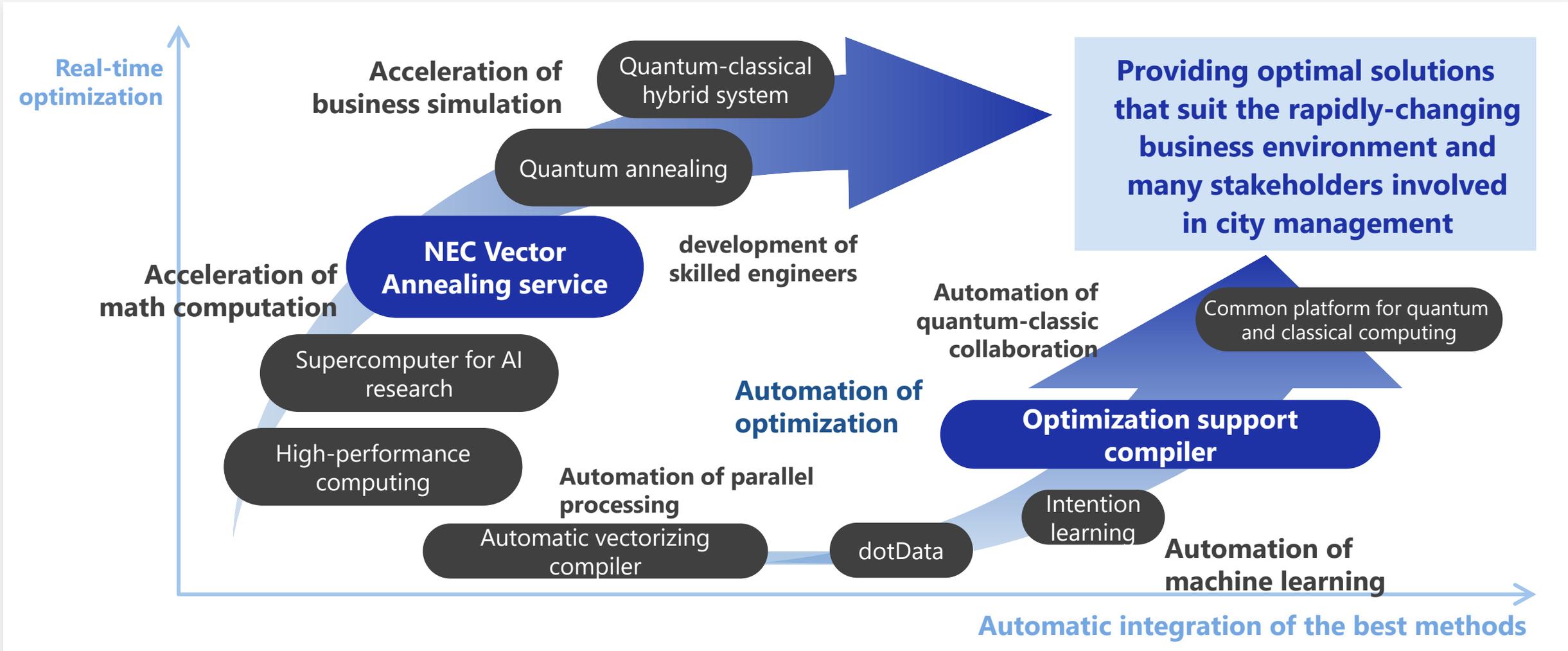
Automatic integration of the best methods

Remote

Real-time



What optimization is needed to solve social problems?



NEC Vector Annealing service

Simulated quantum annealing that finds optimal solutions from a massive number of combinations of options in a realistic timeframe

- Case: NEC Fielding adopted the NEC Vector Annealing in October 2022, turning their two-hour task by experienced staff into a 12-minute automated operation.



Solution

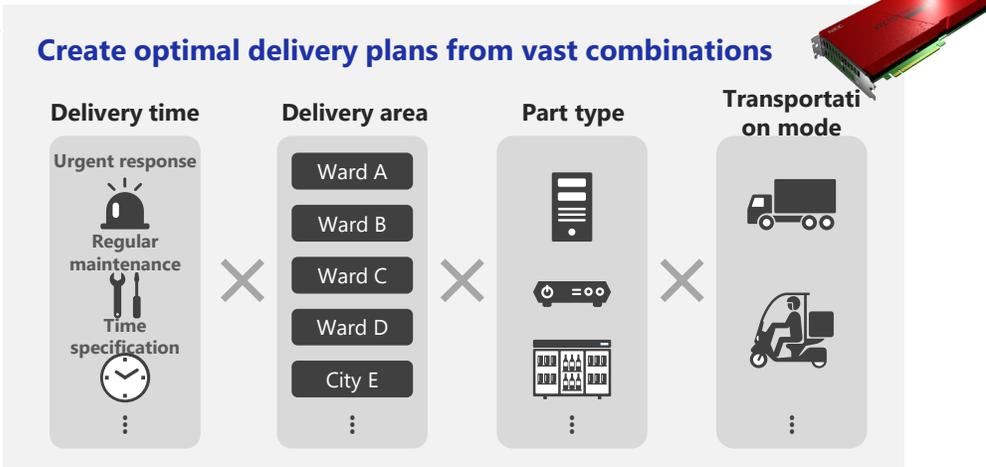
Automatically formulate optimal delivery plans from vast combinations of delivery times, areas, and modes of transportation

Effects

Confirmed automatic generation of plans of the same standard as those created by experienced staff

Currently tuning to improve delivery efficiency by 30%, which is the upper estimated limit

Create optimal delivery plans from vast combinations



Future prospect

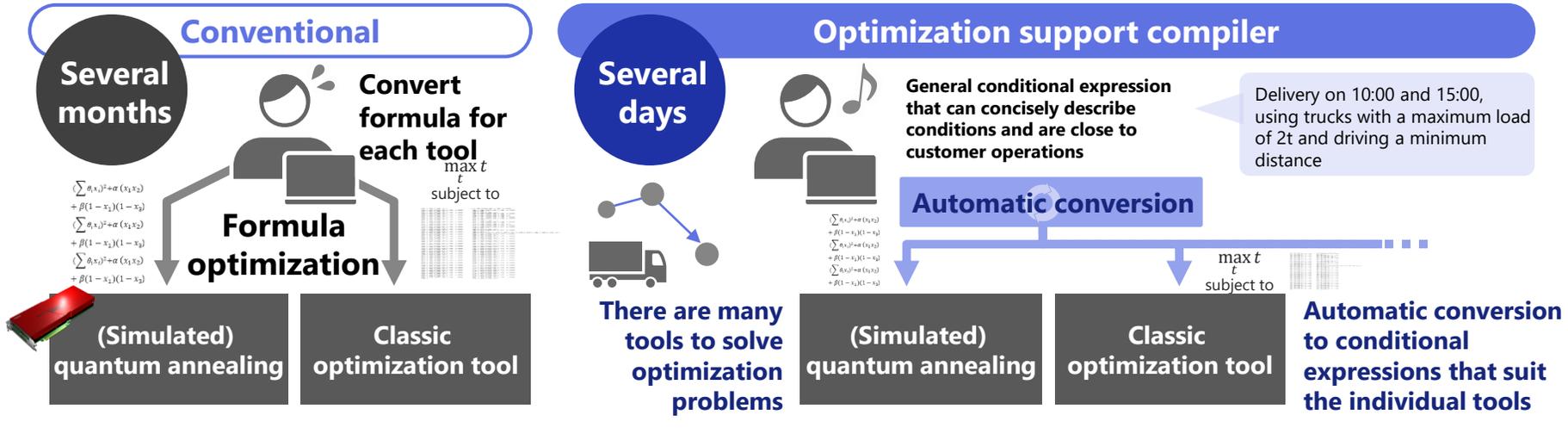
Utilize NEC Vector Annealing service combined with AI-driven future prediction as a management support tool for making investment decisions and formulating business strategies



Optimization support compiler

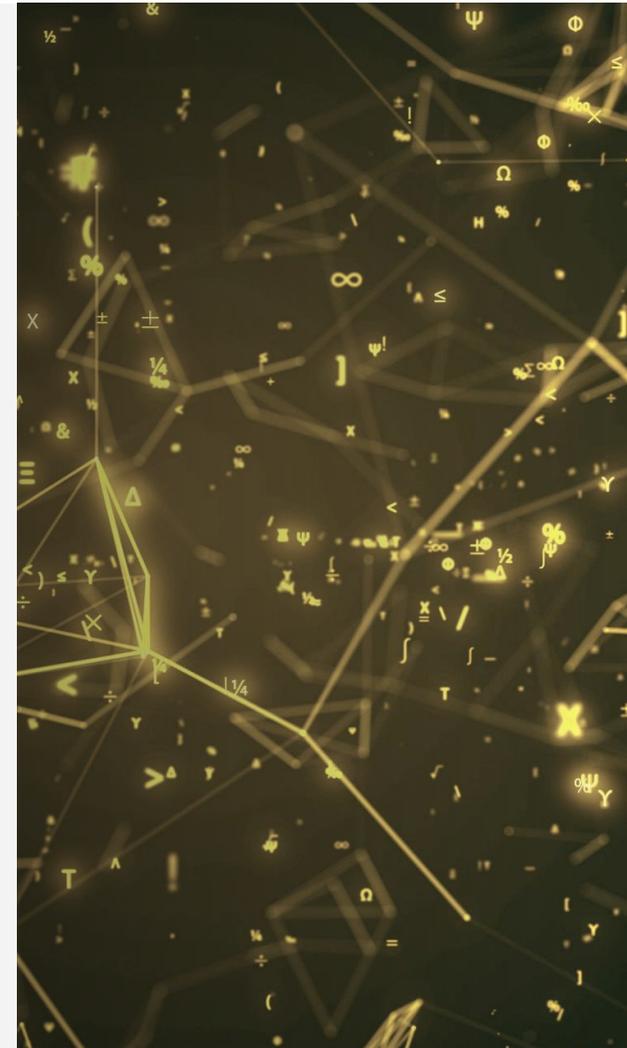
Software development environment with optimization assistance makes the whole problem-solving process much shorter

- Automatically convert given problem-description into a set of precise formulas suitable for the selected optimization tool

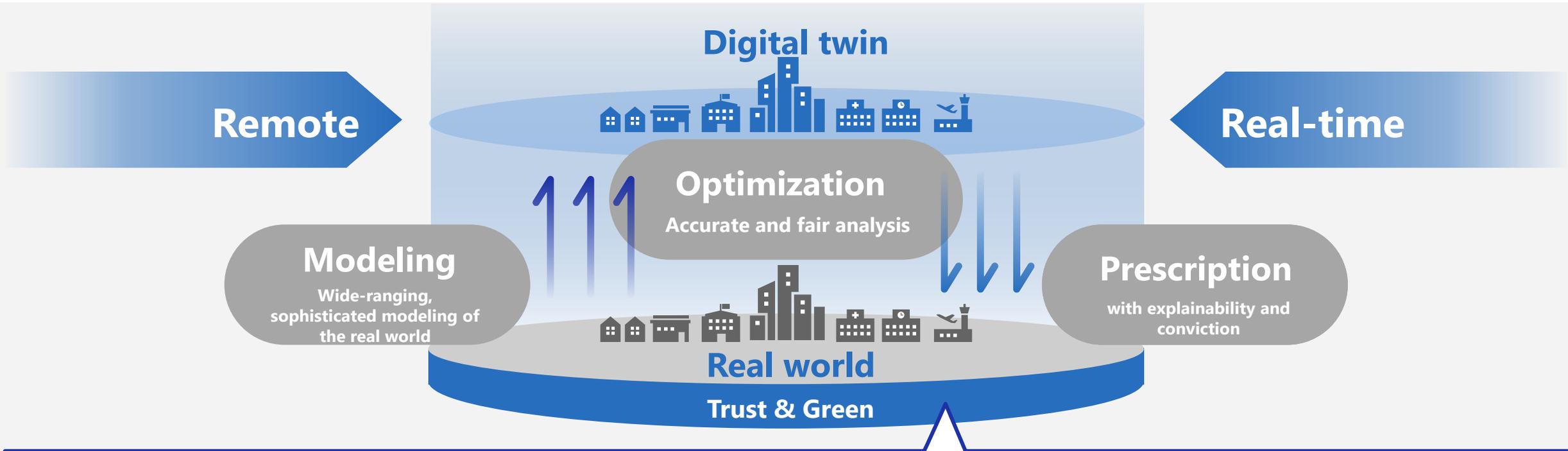


Future prospect

Can be used as a common optimization-solver middleware for both of classic optimization and (simulated) quantum annealer



Platform that supports sustainable society



To simultaneously achieve non-stop city activities and environmental contributions

Deliver stable services with trust

Optimally perform dynamic control of the platform according to the intricately and frequently changing environment

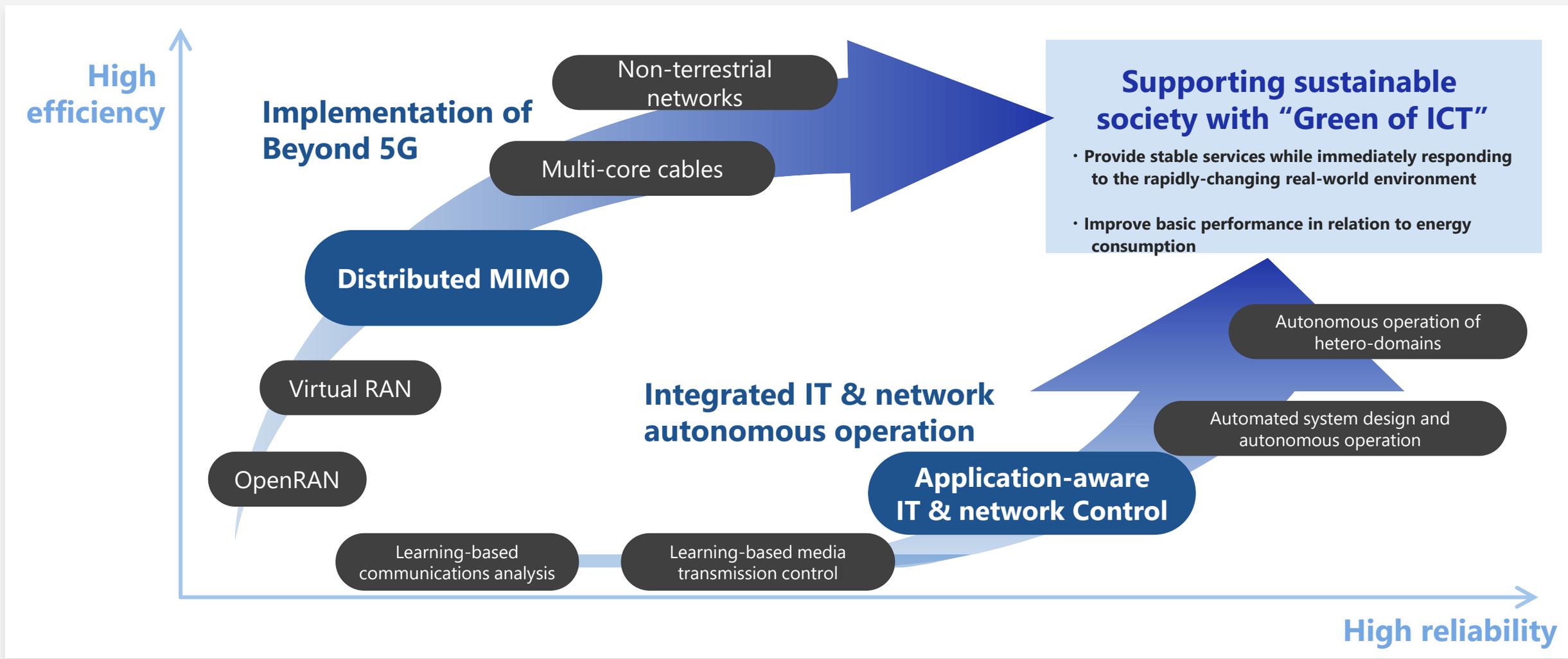
High reliability

Enhance basic performance and contribute to the environment

Improve ICT performance for achieving "anytime anywhere" while reducing CO2 emissions

High efficiency

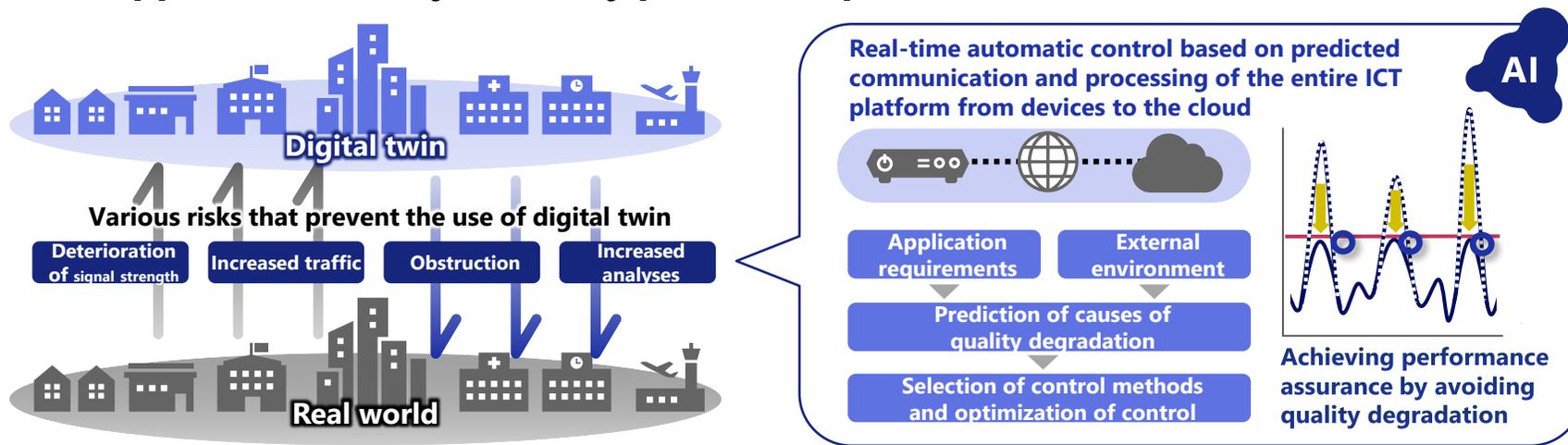
ICT platform technology that realizes Trust & Green



Application-aware IT & network control

Autonomous real-time control of ICT platform enables stable operation at all times

- AI predicts resources required for the entire ICT platform with the understanding of the application and dynamically performs optimal control



Future prospect

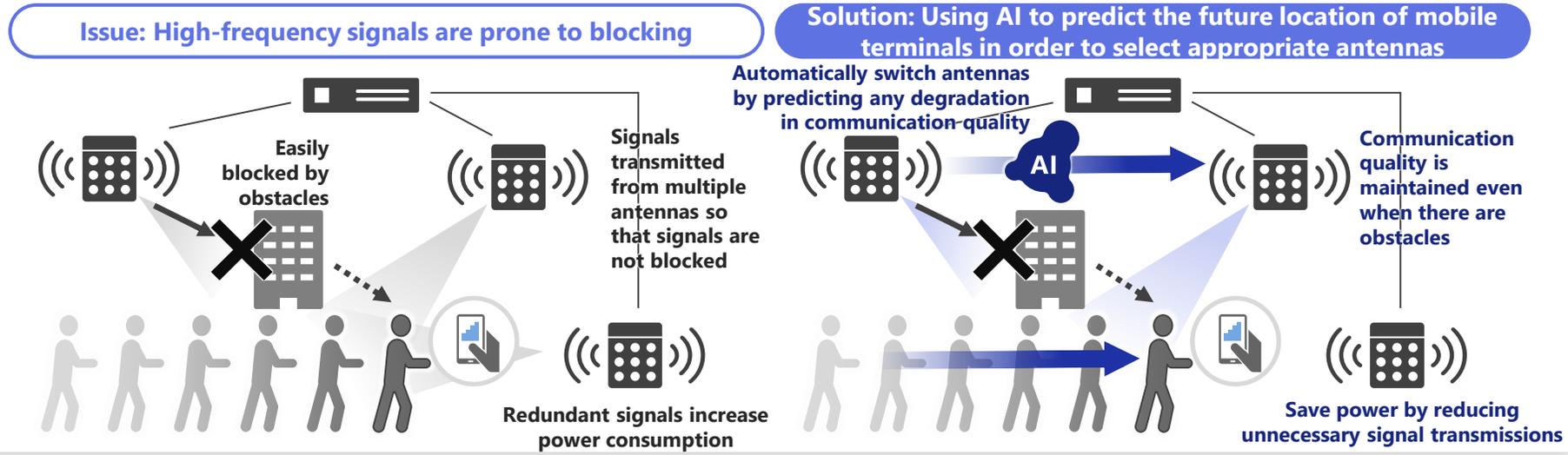
Platform technology to support a variety of digital twins that can immediately respond to changes in cities and industries



Beyond 5G Distributed MIMO

Using AI to prevent signal blocking by obstacles—a challenge for widely spreading super-large capacity communications

- Achieve stable large-capacity high-speed communications even in places where obstacles such as buildings and other constructions are abundant



Future prospect

Support non-stop city operations by efficiently achieving uninterrupted large-capacity high-speed communications