

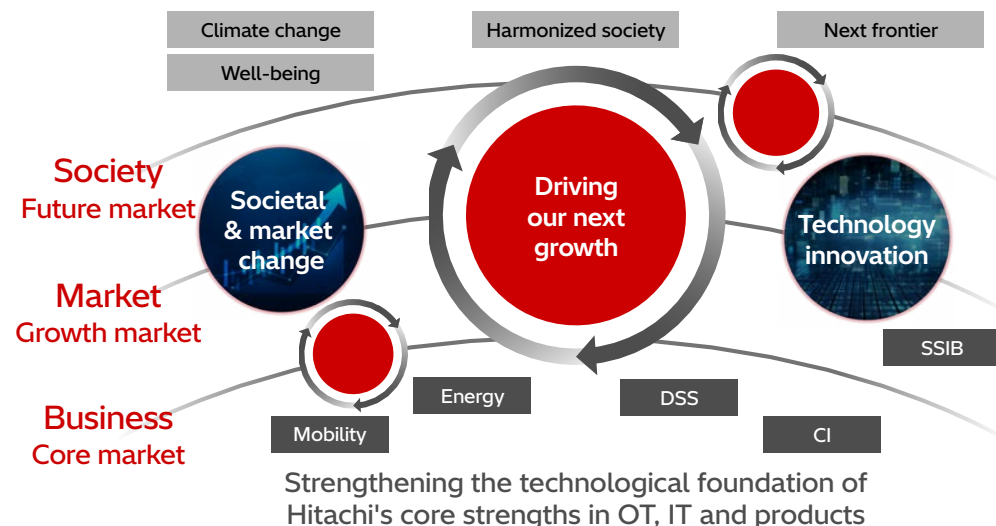
Research & Development Strategy

R&D strategy vision

—Driving technology differentiation and accelerating commercialization, capturing market and technology inflection points

Hitachi is capturing market and technology inflection points and accelerating commercialization through research and development. In addition to growing its core businesses through the expansion of the Lumada business, Hitachi is advancing technological innovation through Group-wide collaboration and strategic partnerships with external partners to capture growth markets in strategic fields across regions and countries, and to create new markets by addressing social challenges. Through these initiatives, Hitachi will strengthen the technological foundation of its core strengths in IT, OT and products, while translating the outcomes of R&D into business value and contributing to the resolution of social challenges and business growth.

Creating inflection points and pioneering new horizons toward a Harmonized Society



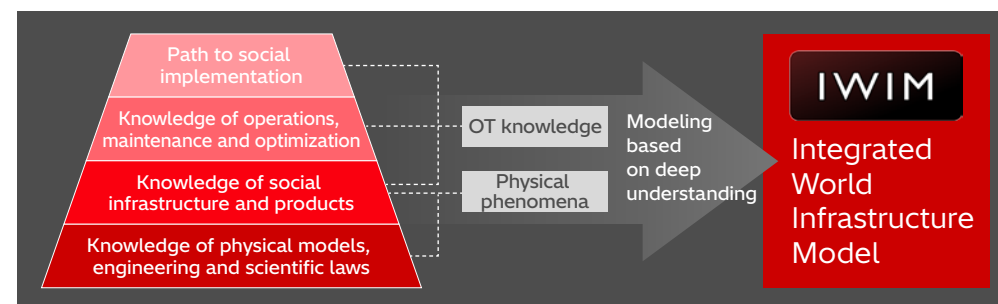
Contributing to the growth of four core businesses

Hitachi's R&D supports the competitiveness and sustainable growth of its core businesses by expanding the Lumada business through HMAX, and advancing differentiation through physical AI. Looking ahead to customers' business model transformation, Hitachi is developing and scaling AI-enabled business models while expanding business opportunities across industries by implementing physical AI in social infrastructure through a new infrastructure intelligence foundation model.

Integrated World Infrastructure Model (IWIM): A social infrastructure intelligence foundation model

To implement Physical AI safely and reliably in mission-critical social infrastructure, it is essential to prevent serious risks such as large-scale power outages and railway accidents resulting from incorrect AI decisions. Accordingly, drawing on its multilayered OT knowledge accumulated over many years and its deep understanding of physical phenomena, Hitachi has developed IWIM, a social infrastructure intelligence foundation model designed for AI-enabled operations. IWIM supports appropriate decision-making and control of equipment and systems even under complex conditions, while enhancing the entire life cycle from design and construction to operation and maintenance in an integrated manner. Through its implementation, IWIM supports the transition to safe, highly reliable and highly efficient autonomous operation of social infrastructure and continuously creates value.

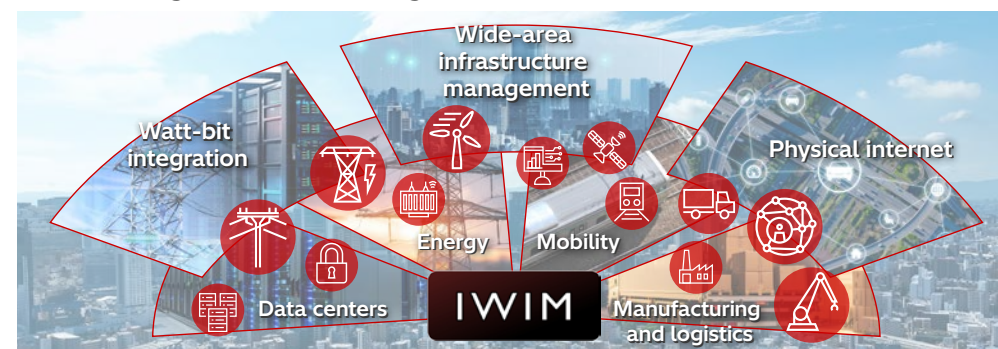
IWIM framework



Creating Lumada synergies through IWIM

IWIM enables the safe and sustainable advancement of social infrastructure fields, including data centers, energy, mobility and manufacturing and logistics. It also helps address challenges in cross-domain areas created through the convergence of these industries. As collaboration across industries and layers and the optimization of social infrastructure become increasingly important, Hitachi will use IWIM as a foundation for innovation across social infrastructure and accelerate the creation of synergies within the Lumada business.

Social challenges IWIM is addressing



Synergy use cases enabled by IWIM

Use case 1 Manufacturing: Physical AI orchestration system

In industrial workplaces, preserving front-line operational capabilities and passing on skills amid a shortage of experienced workers have become urgent challenges. To address these challenges, Hitachi has developed Front-line Coordinator – Naivy, a next-generation AI agent that effectively integrates and coordinates on-site information and provides necessary information to workers and robots in a timely and easily understandable way. Naivy will be offered as part of HMAX Industry, its portfolio of next-generation solutions for the industrial sector. By integrating Naivy with IWIM and enhancing a variety of interaction capabilities, including AI debriefing for operational review, Hitachi will accelerate the capture and utilization of on-site knowledge and support the co-evolution of workers, AI and robots.



Note: "Naivy" is a product/service name used in Japan.

Conceptual rendering of Naivy

Use case 2 Energy: Optimizing power grid interconnection planning

In North America, Southwest Power Pool Inc. (SPP) is seeing an increasing number of generation and load interconnection requests as electricity demand surges, driven by the rapid expansion of data centers, EV charging and manufacturing. In partnership with NVIDIA, Hitachi is applying the IWIM concept, which integrates AI with models of physical infrastructure—including the power grid, generation resources, data centers and other loads—to accelerate transmission planning while maintaining engineering rigor. Through this initiative with Hitachi combined with other internal processes, SPP anticipates reducing the study processing time by 80%, enabling faster decision-making, higher quality solutions, and improved overall efficiency.



Power generation and transmission facilities, North America (image)

In addition to these industry-specific use cases, Watt-Bit integration is an example of an approach that addresses challenges across multiple domains. When transmitting electricity (watts) is difficult, the system instead transfers AI-processed data (bits) to data centers in other regions, thereby optimizing load distribution across the entire power grid. IWIM combines power grid analysis technologies with data center operational expertise to digitally model complex physical phenomena and the causal relationships underlying operations. This enables optimized operation of power grids and data centers based on highly accurate forecasts.

Other examples include wide-area mobility infrastructure management, which supports efficient urban transportation by coordinating power grids and mobility systems, and the physical internet, which enables seamless coordination between manufacturing and logistics. Hitachi is leveraging IWIM to address challenges across a wide range of cross-domain applications.

Capturing growth markets

Hitachi's R&D is advancing the development of technologies that help secure leading positions in growth markets in priority areas, including data centers and healthcare, promoted by the Strategic SIB (Social Innovation Business) BU. Drawing on the social challenges and industrial needs unique to each region and country, Hitachi is creating new value by combining advanced digital technologies with knowledge cultivated through social infrastructure. Examples include high-efficiency cooling systems and power optimization technologies that support energy-efficient data center operations, as well as technologies that accelerate pharmaceutical manufacturing processes and enhance automated cell culture. Through these technological advances and co-creation with partners, Hitachi will accelerate commercialization, support the transformation of society and industry, and achieve sustainable growth.

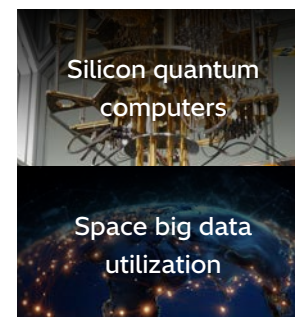
Growth markets prioritized by Hitachi



Creating new markets

In its Next domain, which is focused on addressing increasingly complex social challenges and creating new markets for the future, Hitachi is pursuing world-first and world-leading technologies, including breakthroughs in computing performance through large-scale silicon quantum computers and innovations in infrastructure operation and maintenance using space big data. With Chowa-no-Oka, a social infrastructure research center scheduled to be established in Hitachi City, Ibaraki Prefecture, in 2030, as a hub, Hitachi will strengthen its open ecosystem with academic institutions and partners in Japan and overseas and promote a consistent approach that spans cutting-edge research through social implementation across multiple disciplines. Through these initiatives, Hitachi will help realize a harmonized society by digitally transforming social infrastructure.

Initiatives in the Next domain



Conceptual rendering of the Chowa-no-Oka research center building



New research hub,
Chowa-no-Oka

(Scheduled to open in
2030, Hitachi City)