

CONCEPT

Supporting Customer Growth Strategies by Anticipating Market Change

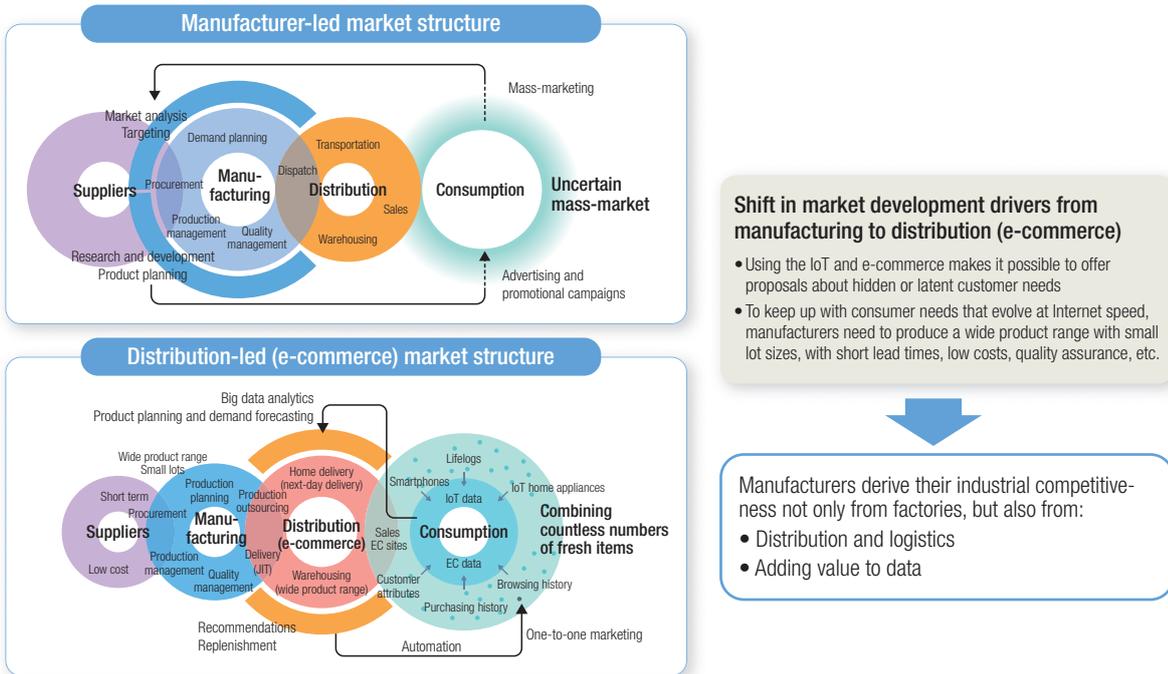
End-to-end Optimization of Value Chains

Changes in economic and social conditions, which include the growing diversity of consumer needs, changes in purchasing behavior, and the globalization of corporate activity, are also driving innovation in industrial and distribution sectors. Hitachi is developing a diverse portfolio of businesses that support the industrial and distribution sectors, from digital solutions that combine information technology and control to industrial equipment solutions. Drawing on proven strengths in the integration of operational technology, information technology, and products, advanced digital solutions with Hitachi's Internet of Things platform, Lumada, at their core are providing support for innovation aimed at resolving the challenges faced by customers and improving their competitiveness.

Response to Changes in the Industrial and Distribution Business Environments

The business environment in the industrial and distribution sectors is going through major changes driven by the intensification of competition associated with economic globalization, the increasingly rapid pace of technical innovation resulting from advances in digitalization, and customer-driven changes in the market structure brought about by e-commerce. Before information technology (IT) became well-established, markets had a manufacturer-led structure with mass-produced products based on mass-marketing. In contrast, advances in IT and the Internet of Things (IoT) over recent years have made it possible to obtain a detailed understanding of customer needs, giving the advantage to those companies able to respond quickly to diverse needs. In other words, the point of greatest leverage in the value chain has shifted from manufacturing to distribution (see [Figure 1](#)).

Figure 1 | Changes in the Structure of Industry



EC: e-commerce IoT: Internet of Things JIT: just-in-time

Hitachi has paid close attention to these changes in the business environment and has a wide range of solutions extending from manufacturing to distribution to help customers overcome their challenges. Hitachi also introduced a new business structure based on business units in April 2016 to strengthen its “front” (customer-facing) activities and to accelerate collaborative creation with customers. This change has made it possible for Hitachi to identify quickly the challenges facing customers in the industrial and distribution sectors, and to draw on both its extensive product range and high-level services to more rapidly and effectively support customers in overcoming these challenges than in the past.

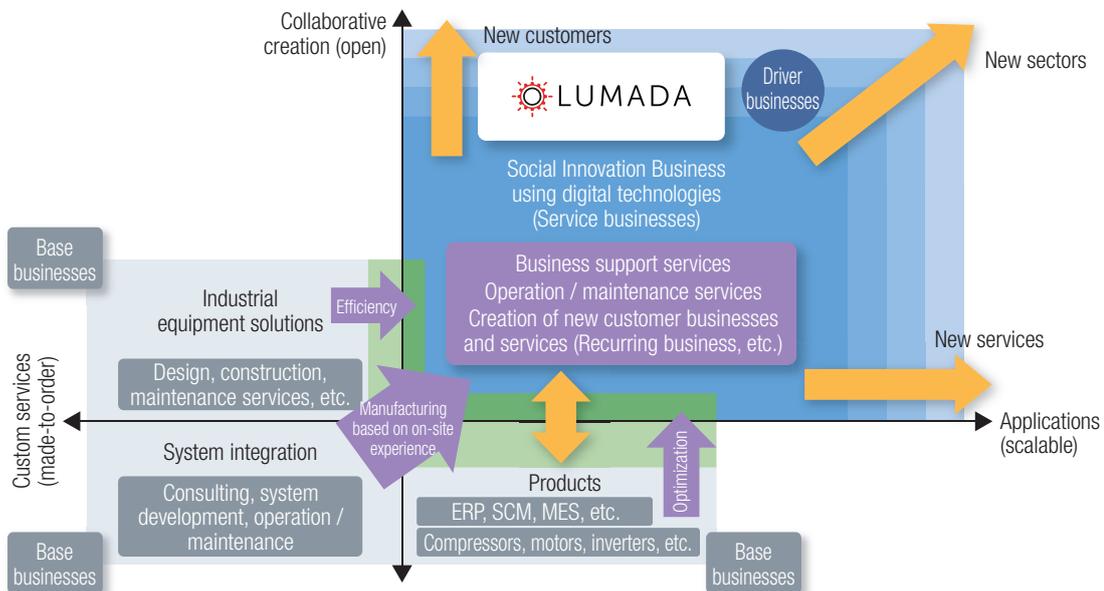
Collaborative creation is underpinned by control and operational technology (OT) that Hitachi has honed through its own manufacturing operations and in response to customer needs, by IT that supports management through the analysis and utilization of data, and by the products that support these technologies. Hitachi intends to utilize its Lumada IoT platform to deploy these more widely in the domain of its Social Innovation Business. The aim is to achieve innovation in the

industrial and distribution sectors by establishing new customers and services in the process of opening up new markets, including management support services that use big data analytics, operation and maintenance services that use predictive diagnostic techniques, and recurring revenue models that evoke cyclic demand (see Figure 2).

Targeting End-to-end Optimization of Value Chains

A rising tide of digitalization is flooding society, with advances in digital technologies such as big data analytics, artificial intelligence (AI), and robotics bringing drastic changes to past practices and ways of thinking. In business, this is expected to lead to improvements in operational efficiency and competitiveness, both by putting these digital technologies to use and by establishing new ecosystems through collaborative creation with partner businesses in ways that transcend the boundaries between industries, thereby enabling a rapid response to changes in the marketplace and the optimization of all steps along the value chain.

Figure 2 | Directions Hitachi Aims to Take in the Industrial and Distribution Sectors



ERP: enterprise resource planning SCM: supply chain management MES: manufacturing execution system

Hitachi supplies its Lumada IoT platform to serve as a basis for these innovations. Lumada is a platform for collaborative creation with customers that consolidates the OT and IT experience that Hitachi has continued to hone over many years. It helps customers overcome challenges and create value by collecting and coordinating a diverse variety of operational data on things like the operation of equipment in the field, the movement of people or goods, and sales data, and then using the latest techniques such as AI to analyze this data and provide the results as feedback.

By using Lumada, the industrial and distribution sectors can provide and share information from all steps along the value chain, and rather than focusing on individual optimizations, they can instead achieve end-to-end optimization that extends from design to procurement, manufacturing, distribution, sales, logistics, and maintenance (see Figure 3). Due to its open design, Lumada also facilitates end-to-end optimization of the full value chain by making it easy to incorporate products and packages from other vendors. Another feature is its ability to provide a suitable environment for customers, with security functions

that enable the secure analysis of operational and management data.

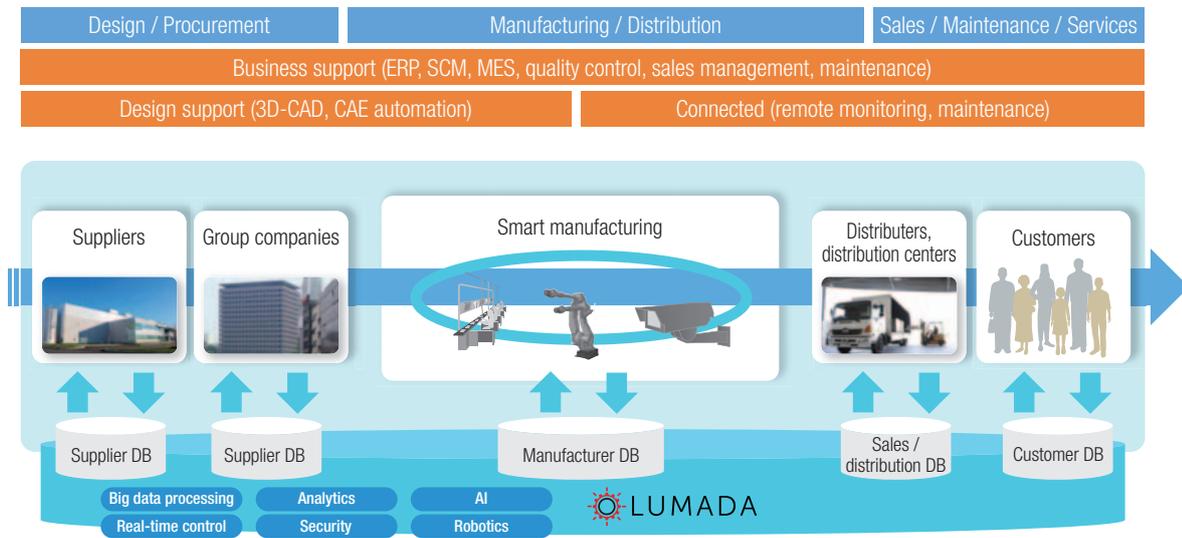
To strengthen its range of digital solutions based on Lumada as a platform, Hitachi is also accelerating the development and global deployment of solutions to new challenges facing the industrial and distribution sectors, encompassing more advanced design, production, and distribution to meet increasingly diverse needs; quality assurance in global production systems; and faster decision-making amid ever more complex and sophisticated management practices.

Key Examples of Solutions Based on Lumada

To enable Lumada to be rapidly adopted by customer businesses, Hitachi has produced templates for a variety of use cases that use “OT × IT × products” to overcome challenges.

The increasingly rapid pace of change these days is making it ever more important to speed up value creation. Hitachi has built up a proven track record of overcoming challenges in growth markets including automobiles and pharmaceuticals,

Figure 3 | Creation of New Value through End-to-end Connections



CAD: computer-aided design CAE: computer-aided engineering DB: database

and intends to make use of these use cases as it offers solutions for a wide range of industries. The following sections describe a number of key examples of solutions that are based on Lumada.

◎ Enterprise resource planning (ERP) solutions

These solutions utilize the SAP® S/4HANA in-memory platform for the high-speed processing and analysis of huge amounts of data to speed up management decision-making and enable the rapid formulation and implementation of business strategies by integrating and analyzing sensing data from production equipment. Hitachi is a top-level leader in Japan for SAP-related business (by Hitachi estimates), and Hitachi Group has extensive implementation experience and expertise as a SAP user. Drawing on these strengths, Hitachi is able to provide solutions that meet the challenges of its diverse customers by supplying specific templates for each industry.

◎ Support solutions for design work

Hitachi has introduced a cloud-based support solution for design work that allows the design environment, including three-dimensional computer-aided design (3D-CAD), computer-aided engineering

(CAE), and other data, to be shared across multiple distributed workplaces. The solution helps shorten the development period, boost efficiency of factory work, and improve the security of the design process by sharing design data and expertise across every step of the value chain and by allowing more sophisticated design work utilizing AI.

◎ Solutions for the pharmaceutical industry

There is a growing demand in the pharmaceuticals sector for ways to improve work efficiency, especially in the processes from non-clinical and clinical studies to regulatory approval. Hitachi supplies consulting services that address this challenge. It is also promoting collaborative creation aimed at achieving innovation in drug discovery, including by increasing the speed of drug development and identifying unmet medical needs (conditions for which no effective treatment has been found) by combining data from multiple sources and analyzing them using AI to transform data into value. The sources of these data include open data such as medical research papers; real-world data such as electronic medical records; and customers' own in-house data; in addition to the data collected by healthcare apps, optical topography, and other such techniques.

* SAP is a registered trademark of SAP SE in Germany and other countries.

◎ Smart manufacturing solutions

These solutions facilitate the handing on of on-site expertise by linking advanced image analysis systems to manufacturing execution management systems to digitalize on-site expertise, processes, and skills. Examples of the benefits of these solutions include better quality assurance and equipment utilization, which are achieved through collaborative creation with customers on solutions that use man, machine, material, and method (4M) data from the manufacturing site as a basis for predicting equipment problems or for detecting when the motions of workers deviate from standard practices.

◎ Logistics solutions

Hitachi is seeking to supply distribution data platforms to customers in Asia for dealing with the challenges of cold chain distribution, such as ensuring the safety and security of food and the efficiency of delivery. Through the comprehensive analysis of a variety of different data on things like cargo tracking, temperature monitoring, and delivery route optimization, these solutions help reduce wastage and improve quality of life by ensuring regular deliveries together with temperature and quality control.

In the future, Hitachi intends to expand these latest initiatives beyond Japan to focus on markets such as Asia and North America.

COLUMN

Seeking to Grow Alongside Customers Using Digital Technologies

Up to now, Hitachi has contributed to optimizing and otherwise enhancing the efficiency of customers' businesses in the industrial and distribution sectors through businesses such as its system integration business, which supplies services including consulting, system development, operation, and maintenance; its product businesses, which supply services including enterprise resource planning and manufacturing execution systems; and its industrial equipment solutions business. The Industry & Distribution Business Unit supplies services unique to Hitachi, based on Lumada, that combine the strengths of these existing businesses with operational technology that runs customers' operations.

Using digital technologies to add value to real-world data and to put it to use in management also facilitates the development of new services or other businesses by customers. Along with improving current circumstances, contributing to the future-oriented growth strategies of customers is also an important role for us. To fulfill that role, our aim is to



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overcome challenges through collaborative creation with a wide range of customers, and to grow in partnership with them.

By linking a wide variety of systems and customers together while also working with partners using Lumada as a platform, we will continue to transcend the limitations of existing value chains to build new ecosystems that are more flexible and progressive. Our aim is to be an innovation partner for the IoT era, creating new value with our customers.