Expanding the Supply of Lumada Digital Solutions

To help realize a sustainable society, Hitachi is promoting global upscaling of the Social Innovation Business by increasing the supply of solutions that utilize digital technology based on collaborative creation with customers.

1. Digital Solution Supply Initiatives to Date

Hitachi's stated aim in the 2018 Mid-term Management Plan is to be "an Innovation Partner for the IoT Era" by embracing the digital revolution that is transforming society and industry. Since April 2016, Hitachi's operations have been divided along organizational lines into the three levels of "Front," "Platform," and "Product."

The rationale behind this move is to adopt a customer-centric business model to identify new markets for applications, rather than the conventional focus on supplying products. The aim of "Front" operations is to identify customer issues and to put in place a "Platform" that makes full use of OT and IT in a bid to efficiently provide relevant solutions, while the aim of "Product" operations is to supply highly competitive products.

In May 2016, Hitachi began supplying Lumada-based digital solutions to help address management issues linked to customer value chains.

Condensing the OT and IT expertise that Hitachi has accumulated over many years into a rich array of solutions, Lumada is a way of supplying customers with digital technology-derived innovations in a speedy and efficient manner. In practical terms, Hitachi is amassing Lumada customer cases through collaborative creation with customers as well as internal development of Lumada solutions within the Hitachi Group.

In both instances, a digital solution is created using Lumada to support the analysis of multiple types of variable data using AI or other big data analytical methods.

Based on existing customer cases, Hitachi is accelerating global upscaling of the supply of Lumada digital solutions by seeking to develop solution cores with generalized applicability to the needs of various customers.

In fiscal 2015, to expand collaborative creation through assignment of researchers to centers based close to customers while reinforcing innovative capabilities aimed at creating original technologies to satisfy market requirements, Hitachi established the Global Center for Social Innovation (CSI) as part of reforms to the Group's global R&D structure. The CSI focuses on collaborative creation in which researchers, designers and other Hitachi personnel work with customers on the development of digital solutions. Currently, there are CSI facilities in five key regions, with bases in Tokyo, North America, China, Europe, and Asia-Pacific (APAC). The collaborative creation process at these bases with customers, business partners, and other stakeholders is called "NEXPERIENCE." It involves finding multifaceted ways to visualize knowledge to facilitate smooth solution development, the utilization of IT tools, and a systematized co-creation methodology.

Billions of yen	FY2016 (result)	FY2017 (result)		FY2018 (forecast)	
		Initial target[1]		Initial target[1]	
Revenues of Lumada business	900.0	950.0	1,006.0	1,050.0	1,070.0
Lumada core business[2]	120.0	190.0	230.0	290.0	310.0
Lumada SI business[3]	780.0	760.0	776.0	760.0	760.0

[1] As released on Hitachi IR Day 2017 in June 2017
[2] Service businesses where AI and analytics are utilized to convert customer data into valuable insights to help improve management indicators or offer solutions to business-related issues
[3] Lumada core business-driven SI operations within the IoT field (industry/social infrastructure-related)

2. Global Development Initiatives

To support the development of the Social Innovation Business from a global perspective, Hitachi is looking to expand the provision of digital solutions by focusing on social issues that are specific to certain markets or regions.

North America

In North America, Hitachi is focusing mainly on the business domains of Industry, Urban (including railways), and Finance.

In the Industry domain, the July 2017 acquisition of US air compressor manufacturer Sullair not only strengthened Hitachi's industrial equipment business, but also created opportunities to expand into digital solutions tailored to sectors such as manufacturing and mobility. For example, Hitachi has developed a service platform to automatically propose optimal repair work for various types of industrial machinery, based on combining Hitachi's strong track record and related know-how in the manufacture and maintenance of industrial machinery (OT) with AI or other digital technologies (IT). Hitachi plans to use this platform to expand sales of its Maintenance & Repair Service to various industrial machinery manufacturers.

In the Urban domain, Hitachi is supplying a wide range of railway products/systems and solutions, from rolling stock to signaling systems. This includes major metro projects in cities such as Miami and Baltimore. Going forward, in addition to supplying railway systems, Hitachi is working to secure orders for turnkey projects that include local construction and engineering as part of expanding the business in North America. Supplying digital solutions utilizing Lumada is another element of regional growth plans.

In the Finance domain, Hitachi established the Financial Innovation Laboratory in 2016 in Santa Clara, California, USA to undertake R&D into FinTech solutions using blockchain and other technologies. Through its involvement in joint research with Stanford University and in the Hyperledger project hosted by the Linux Foundation, Hitachi is working to develop and test practical FinTech solutions using cutting-edge analytical tools for credit scoring, while also contributing to the blockchain community and the development of commercial applications.

Europe

In Europe, the key focus is on the Urban domain, primarily railways.

Hitachi is working to expand operations from product/system businesses such as rolling stock and signaling systems to include railway-related digital solutions. For example, dynamic headway solutions optimize train frequency in line with passenger demand, using predictions of passenger numbers based on people flow analysis. Hitachi is developing a solution of this type for the driverless Copenhagen Metro in Denmark.

China

In China, the key focus is also on the Urban domain.

Hitachi plans to develop its Chinese operations by focusing on data-centric building service business where it has a presence in Japan, including round-the-clock remote monitoring of elevators and other building equipment and predictive maintenance based on the use of operational data to forecast breakdown probabilities.

Asia

In Asia, Hitachi is focusing mainly on the Industry and Social Infrastructure domain.

In the Industry domain, Hitachi established the Lumada Center Southeast Asia in Thailand in September 2018 as a base for the development of the digital solutions business within the ASEAN region.

In the Social Infrastructure domain, in a collaborative creation project with Thailand Post, Hitachi is developing and testing a digital post service to enable users to receive notifications from public-sector institutions via a PC, smartphone or other device as part of creating a new service to provide information using the postal network. Elsewhere in the region, in April 2018, Hitachi formed Hitachi MGRM Net Ltd. following the acquisition of shares in Indian IT services provider MGRM Net Ltd. The new company will lead Hitachi's efforts to support the Indian government's "Digital India" initiatives including "e-Governance" and "e-Education" based on the digitalization of government services.

3. Systemic Investments to Support Global Expansion

Besides combining the digital solutions expertise cultivated to date with advanced technology to develop services with applications across a wide range of sectors, Hitachi is expanding the provision of digital solutions through Hitachi Global Digital Holdings Corporation, which was established in April 2018.

Interoperability with various systems and Lumada will be an important part of the global expansion of digital solutions. To this end, including participation in the Edgecross Consortium[1], Hitachi is actively promoting collaborative creation projects with various stakeholders ranging from other companies to universities and other academic or research institutions.

As part of developing the human capital necessary for creating digital solutions, Hitachi has instituted a training program to cultivate data scientists with the required skills. To help foster conditions needed to create original expertise, Hitachi has also established the Professional Community for top-class researchers and practitioners from every field to share relevant knowledge.

Hitachi's target through these initiatives is to increase the number of data scientists working in the Hitachi Group worldwide from around 700 at present to 3,000 by fiscal 2021 to support further expansion of the digital solutions business.

[1] A body established on November 29, 2017 with the aim of going beyond the basic framework of companies and industries to create new value in the field of edge computing through involvement in activities to support the IoT conversion of the manufacturing industry, the "Society 5.0" [2] plan advocated by the Cabinet Office, and the "Connected Industries" [3] concept promoted by the Ministry of Economy, Trade and Industry (METI)

[2] A series of initiatives aimed at sharing and realizing the future vision of a "super smart society" in which there is high-level merging of cyberspace with the real world, as outlined by the Cabinet Office in the 5th Science and Technology Basic Plan

[3] A conceptual vision for Japanese industry announced by METI in March 2017

To achieve the goal of being "an Innovation Partner for the IoT Era," Hitachi is working to upgrade its service business with the aim of evolving global supply capabilities for end-to-end solutions.

Copenhagen Metro Project

Hitachi is working with Metroselskabet, the public-sector infrastructure owner of the metro in the Danish capital Copenhagen, to test a dynamic headway solution to adjust the frequency of trains to real-time passenger demand. The solution will combine Hitachi's digital and IoT technologies with the train control systems of Ansaldo STS, a Hitachi subsidiary operating in the railway systems business.

Passenger demand on the Copenhagen Metro varies significantly depending on the time of day and any events occurring near the network. Moreover, the opening of a new line in 2019 is expected to result in a substantial increase in passenger numbers on the existing lines. The elimination of overcrowding in trains is a major issue.

Having used rolling stock and signaling systems supplied by the Hitachi Group for many years, Metroselskabet is an important Hitachi long-term partner. The advanced service provided by Hitachi for the Copenhagen Metro includes driverless trains that run 24 hours a day.

The dynamic headway solution automatically adjusts train frequency using the results of an analysis of changes in passenger numbers, visualizing congestion data collected from sensors located in each station. By easing congestion before it occurs, this provides a more satisfying transport experience for passengers. The system also helps the metro operator to reduce costs by adjusting train frequency to real-time changes in demand, contributing to energy savings along with higher efficiency.