Featured Articles

Intelligent Operations Utilizing IT to Accelerate Social Innovation

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OVERVIEW: Hitachi is proceeding with the global deployment of its Intelligent Operations solutions for using information to reform social infrastructure. This extensive range of services is supplied to 11 different industry sectors, including mining, healthcare, and logistics, extending from consulting to the implementation and operation of industry-specific systems that run on IT platforms. Business operators can use Intelligent Operations for the efficient and global provision of uniform services that are closely matched to the needs of specific industries and regions.

INTRODUCTION

MORE than a decade into the 21st century, the increasingly prominent global challenges that face society include (1) the aging of populations, particularly in the developed economies, and the consequent increase in welfare costs and reduction in the workforce, (2) the difficulty of satisfying global demand for resources such as energy and food, and (3) dealing with the extreme concentration of populations in urban areas and the aging of social infrastructure.

Considering progress in information and telecommunications technology, on the other hand, advances in computer and network technology are making it possible to process complex data at high speed and in large quantities without being impeded by regional constraints. Similarly, the falling cost of sensors and other devices, and their online connection to networks, are making possible the low-cost, centralized management of the various different types of information associated with people's lives and business activity, resulting in people taking active steps to utilize information that would have been ignored in the past.

Given these circumstances, Hitachi is using information to reform social infrastructure, placing social innovations that make life safer and more secure and deliver business growth at the core of its business.

Intelligent Operations is Hitachi's name for its service and product solutions that seek to use information technology (IT) to accelerate social innovation. This article provides an overview of Intelligent Operations, describes its future global deployment, and presents case studies of its use.

USE OF INFORMATION TECHNOLOGY TO ACCELERATE SOCIAL INNOVATION

Modern society is underpinned by a large number of devices that are used in daily life or business activity. People carry smartphones and other portable devices, cars are controlled by 150 or more sensors, and the healthcare sector uses numerous devices to monitor patient health. In the business sector, it is anticipated that the use of information will be encouraged in a diverse range of situations in the future. Examples include the monitoring of aging social infrastructure such as bridges and tunnels, improvements to machinery utilization at production facilities, modeling and sharing of the knowledge and skills of the people who work there, and the efficient production and distribution of energy and other resources.

If social innovation is to be achieved through the use of detailed information from the field, it will require a fusion of IT with operation technology for the collection and control of information from devices. It will also require the use of formalized real-world knowledge and analysis techniques to discover the value contained within this information, and the provision of mechanisms that can use it as feedback in tasks such as decision making and device control. To support innovation by society, corporations, and customers, Hitachi has brought together its solutions that use IT to accelerate social innovation under the Intelligent Operations framework (see Fig. 1).

Intelligent Operations draws on technologies for the utilization of big data, highly reliable clouds, and security to provide consulting services, vertical

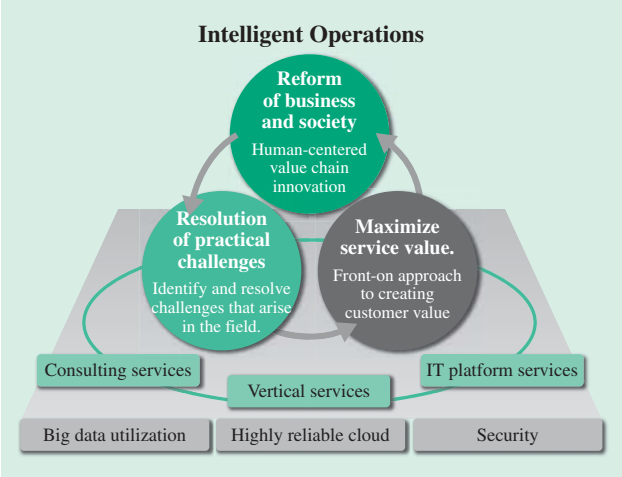

Fig. 1—Overview of Intelligent Operations.
Reform of business and society is achieved through human-centered value chain innovation.

services for specific industries, and IT platform services based on these technologies. Based on these services, Hitachi is creating people-centered businesses and reforming society by identifying the challenges that arise in the field and maximizing service value.

The Intelligent Operations solutions framework consists of three layers. These are the IT platform service that supplies standard platforms (Intelligent Operations Suite), the vertical services that provide system implementation and operation to specific industries, and the consulting services that identify issues, formulate solutions, and provide operational support (see Fig. 2).

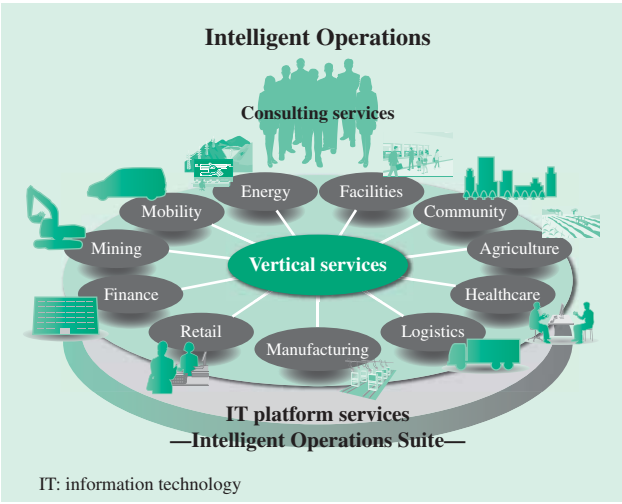

Fig. 2—Intelligent Operations Solution Framework.
The Intelligent Operations framework consists of three layers: consulting services, vertical services, and IT platform services.

TABLE 1. Descriptions of Vertical Services of Intelligent Operations
Hitachi is expediting the provision of solutions to 11 different industry sectors.

	Vertical service	Description
(1)	Intelligent Operations for Energy	Promotion of energy efficiency, adoption of renewable energy, implementation of smart grids that balance supply and demand for electric power
(2)	Intelligent Operations for Mobility	Provision of services for citywide optimization of transportation, including railways and automobiles
(3)	Intelligent Operations for Mining	Productivity improvement through more sophisticated operational management of mining equipment and more efficient maintenance
(4)	Intelligent Operations for Finance	Provision of finance in ways that are tailored to each stage in the customer's business or life, more efficient funds distribution including corporate currencies (redeemable points or similar)
(5)	Intelligent Operations for Retail	Demand prediction and support for product strategy and development, taking account of the greater diversity and shorter lifecycles of products
(6)	Intelligent Operations for Manufacturing	Total support encompassing product installation, operation, and maintenance with a direct link between customers, sites where the product is used, production lines, and developers
(7)	Intelligent Operations for Logistics	Provision of IT services that support management strategies while boosting supply chain efficiency, taking account of factors such as growing demand in emerging economies and the offshoring of production facilities
(8)	Intelligent Operations for Healthcare	Highly secure collection of data held by healthcare providers and its use for analysis to provide services to insurers or pharmaceutical companies
(9)	Intelligent Operations for Agriculture	Amid concerns about crop failure and food shortages caused by population increase or abnormal weather, this service seeks to stabilize prices and improve distribution efficiency by making agricultural production more reliable and transforming agriculture into a "senary industry" (a term used in Japan to refer to the added-value production and distribution of agricultural goods).
(10)	Intelligent Operations for Community	Provision of programs that contribute to health promotion for the elderly to help create living environments that are suitable for an aging population
(11)	Intelligent Operations for Facilities	The use of advanced sensing technology and big data to improve the safety of aging social infrastructure, and to minimize its maintenance and refurbishment costs

Vertical services utilize information on people's activities, equipment operation, and the environment in each industry sector to make improvements in areas such as efficiency and service level. Table 1 lists the 11 industry-specific services that Hitachi offers. These are, (1) energy services, including use of renewable energy and optimization of electric power networks, (2) mobility services for optimizing transportation across an entire city, (3) mining industry services

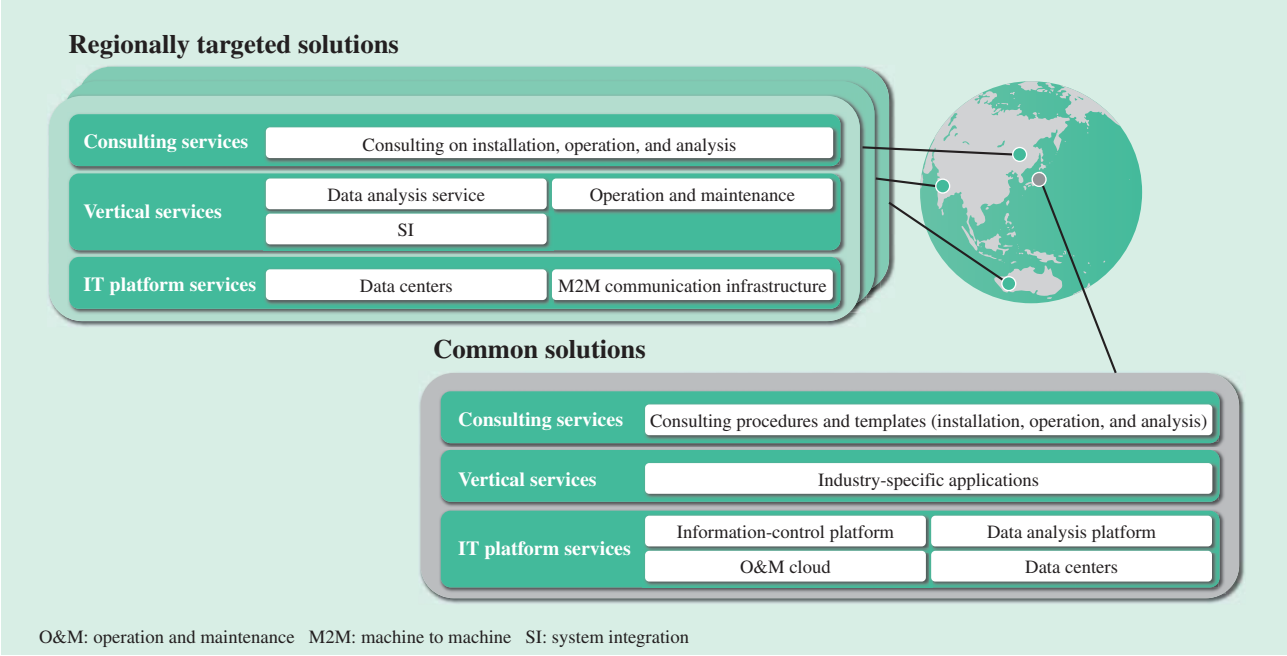

Fig. 3—Global Deployment of Intelligent Operations.
The Intelligent Operations suite offers both regionally targeted and common solutions that are deployed globally.

for improving the efficiency of equipment operation and maintenance, (4) finance industry services for providing finance in ways that suit customer needs and using IT to make the distribution of funds more efficient, (5) retail services for product development and distribution based on demand forecasts, (6) manufacturing services that support products throughout their lifecycle, (7) logistics services that help operate supply chains globally, (8) healthcare services that utilize medical information for purposes such as insurance or drug development, (9) agriculture services for more reliable production and for adding value to crops, (10) community services that promote healthy living for the elderly and others, and (11) services for facilities that improve safety and reduce maintenance costs for social infrastructure equipment.

GLOBAL DEPLOYMENT OF INTELLIGENT OPERATIONS

This section describes the global deployment of Intelligent Operations. Hitachi's aim with Intelligent Operations is the efficient delivery of services that have been tailored to the characteristics of each region. To achieve this, Hitachi is working to establish both regionally targeted solutions that support the creation of services that match the needs of that particular region, and common solutions that raise overall service levels by combining standard products and services of the sort that are required everywhere (see Fig. 3).

Both the regionally targeted solutions and common solutions are made up of three service layers, namely IT platform services, vertical services, and consulting services.

The common IT platforms provided by the common solutions include an information-control platform, data analysis platform, operation and maintenance (O&M) cloud, and data centers. These platforms collect and collate information from equipment used in social infrastructure, and consolidate the information for use in analysis and control[(1)]. The data analysis platform provides standard analysis functions for the searching, analysis, visualization, and optimization of big data archives. The O&M cloud service provides operation and maintenance functions via the cloud[(2)]. The vertical services included in the common solutions provide various industry-specific applications that run on the IT platforms. Hitachi also offers consulting services that include procedures and templates for the installation, operation, and analysis of these applications, IT platforms, and other services.

The regionally targeted solutions are based on the common solutions and localized for particular markets. Data centers, machine to machine (M2M) communication infrastructure, and other IT platforms are provided in a form that suits the particular circumstances of the region. The vertical services

provide system integration (SI), data analysis, and operation and maintenance for specific industries. The consulting services, meanwhile, encompass system installation and operation as well as data analysis, utilizing those services that are also offered as common solutions.

This global deployment of Intelligent Operations will require improvements in the quality of both the regionally targeted solutions and common solutions. Rather than dealing with each solution individually, this will require working through a loop in which the common solutions are revised based on feedback from the different regions and industries, with these changes then being incorporated into the regionally targeted solutions.

To work towards getting Intelligent Operations established globally, Hitachi intends to expedite this loop process by undertaking measures such as proof of concept (PoC) projects in specific industries throughout the world.

CASE STUDIES

This section describes initiatives in the mining, healthcare, and logistics sectors that provide specific examples of the global deployment of Intelligent Operations.

The first example is from the mining industry. With demand for minerals and other natural resources rising throughout the world in response to factors such as rapid growth in emerging economies, there is a need to boost productivity in mining by improving equipment utilization. As mines are often located at remote sites, Hitachi is working on IT systems that will use the cloud to combine equipment information from the mine site with information collected from each step at the factory, and to consolidate this for use as feedback in decision making or control[3].

The next example is from the healthcare sector. The rapid rise in the cost of healthcare has become a problem in recent years as a result of the aging populations in developed economies and the growing prevalence of lifestyle diseases due to rising living standards in emerging economies. Like other developed economies, the UK faces the challenge of caring for the continually rising number of people suffering from chronic illness, and also the need to improve quality and reduce costs throughout the healthcare sector. Against this background, Hitachi is building a medical data sharing system specifically for the Greater Manchester region in the UK that is used to share clinical information, including basic patient information, between different healthcare providers, and is demonstrating a system for repurposing this information[3].

In the logistics sector, meanwhile, supply chains are becoming increasingly global in response to factors such as the growing demand in emerging economies and the offshoring of production facilities in recent years. China in particular is plagued with inefficiencies despite its large market and rapid growth, with the cost of logistics reaching 17 to 18% of gross domestic product (GDP). In response, Hitachi is working on efficiency and other improvements in transportation equipment and the logistics of parts manufacturers in China. It is also seeking to create IT services with high added-value that support corporate operations by facilitating the collection and collation of data from each link in the supply chain, including procurement, production, transportations, retail, recycling, and disposal[4].

CONCLUSIONS

This article has described the global deployment of Hitachi's Intelligent Operations that use IT to accelerate social innovation.

If a better environment is to be provided throughout the world for people to live and conduct business, it is important to be able to deliver both uniform services that are globally standardized and meticulously localized services that take account of regional characteristics and cultural considerations. By providing the consulting services, vertical services, and IT platform services of its regionally targeted solutions and common solutions under the Intelligent Operations framework, Hitachi believes it can contribute to quality improvements in industry-specific systems and greater convenience in all areas of society.

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