Overview

Delivering Innovation through New Approach to Collaborative Creation

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1. Introduction

Marked by a series of events spanning not only politics and economics, but also society as a whole, the year 2018 provided a foretaste of the coming era in which digital technology will facilitate innovation across the world, fundamentally transforming both industry and other parts of society. In this time of uncertainty, Hitachi is working through its Social Innovation Business to help build a better society.

Hitachi's Global Center for Social Innovation (CSI) is taking on the challenge of delivering innovation in the digital era, functioning as a frontline research and development organization responsible for creating new products, services, and business models. It serves as a model for what Hitachi should do in response to the issues facing the world and what values it should deliver.

This article uses examples of work by CSI to describe how collaborative creation with customers is being put into practice globally, how artificial intelligence (AI) and other digital technologies are being used to enhance Hitachi's own NEXPERIENCE methodology for collaborative creation with customers, and a new approach being taken to collaborative creation in preparation for the coming era.

2. Practicing Global Collaborative Creation with Customers

CSI has been working with customers worldwide to put collaborative creation into practice in the key sectors for their respective regions, building up a library of this work in the form of use cases. In doing so, it has contributed to the recording of more than 150 Lumada use cases.

In capital-intensive industrial sectors such as oil and gas, energy, and transportation, CSI has conducted trials of a lifecycle management solution for assets that aims to improve the operational efficiency of remotely located assets and their maintenance as they deteriorate with age. CSI has also trialed a fleet management solution for the mobility sector, including maritime shipping companies, that uses collaborative creation with customers to recommend which vessel operation indicators will help improve fuel efficiency. In the insurance sector, CSI has worked on developing the concept of proactive insurance that incorporates risk prediction technology[(1)].

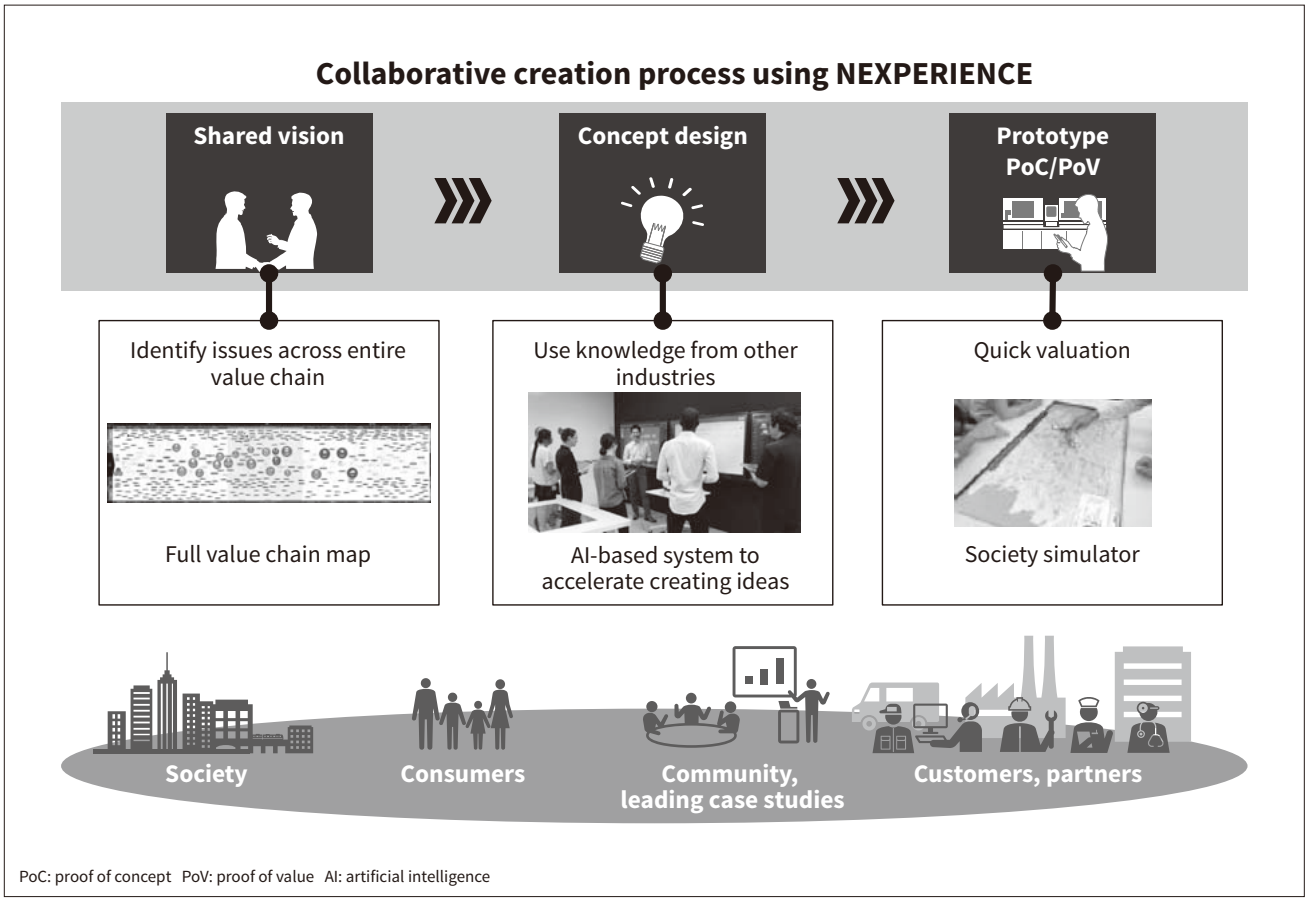
Other articles in this edition of *Hitachi Review* provide details of work on using blockchains in the financial services industry in North America, work on using telematics in mobility services in Europe, smart industry initiatives in China that use technologies and know-how developed in Japan, and involvement with digital smart cities in Japan and other parts of Asia.

3. Enhancements to NEXPERIENCE Using Digital Technology

Creating innovation in the digital era requires the adoption of digital methods for collaborative creation with customers. CSI has drawn on past experience and know-how accumulated over time to develop the NEXPERIENCE methodology that it systematized

Figure 1 — Enhancing NEXPERIENCE Using Digital Technology

Hitachi is enhancing NEXPERIENCE by using digital technology across all steps in the collaborative creation process, including analyzing the issues and reaching a shared vision, constructing hypotheses, and assessing value.



PoC: proof of concept PoV: proof of value AI: artificial intelligence

in 2015[2]. NEXPERIENCE can be used to build digital models of innovation ideas, scenarios, and business concepts; to run simulations for assessing how well these work and what value they create; and to evaluate business viability in terms of things like cash flow and return on investment. Used for more than 1,000 projects to date, Hitachi has further developed this methodology using digital technologies across all steps in the collaborative creation process, including analyzing the issues and reaching a shared vision, constructing hypotheses, and assessing value (see **Figure 1**). This article focuses on the issue analysis and hypothesis construction steps in particular[3].

3. 1
Investigating and Identifying Issues Using Full Value Chain Maps

NEXPERIENCE strongly emphasizes mapping out the customer's long-term vision and business model (the "big picture") and producing a roadmap of how to get there. Sketching out a growth strategy requires identifying issues based on consideration of the ecosystem in which the company operates, including various stakeholders such as its trading partners, suppliers, sales partners, and system development partners.

To this end, Hitachi has developed the concept of a "full value chain (FVC) map" that provides an overview of this ecosystem[4]. A full value chain map is intended for customers in specific industries and uses their value chain as the basis for a visual representation of the relationships between their management issues (internal factors), societal issues (external factors), and the associated solutions. At a collaborative creation workshop with the customer, the FVC map for the relevant industry is used as the starting point for developing a map specific to the customer, and this in turn provides a basis for the subsequent steps of devising solutions to the identified issues, designing business models, developing prototypes, evaluating business viability, and testing solutions in practice.

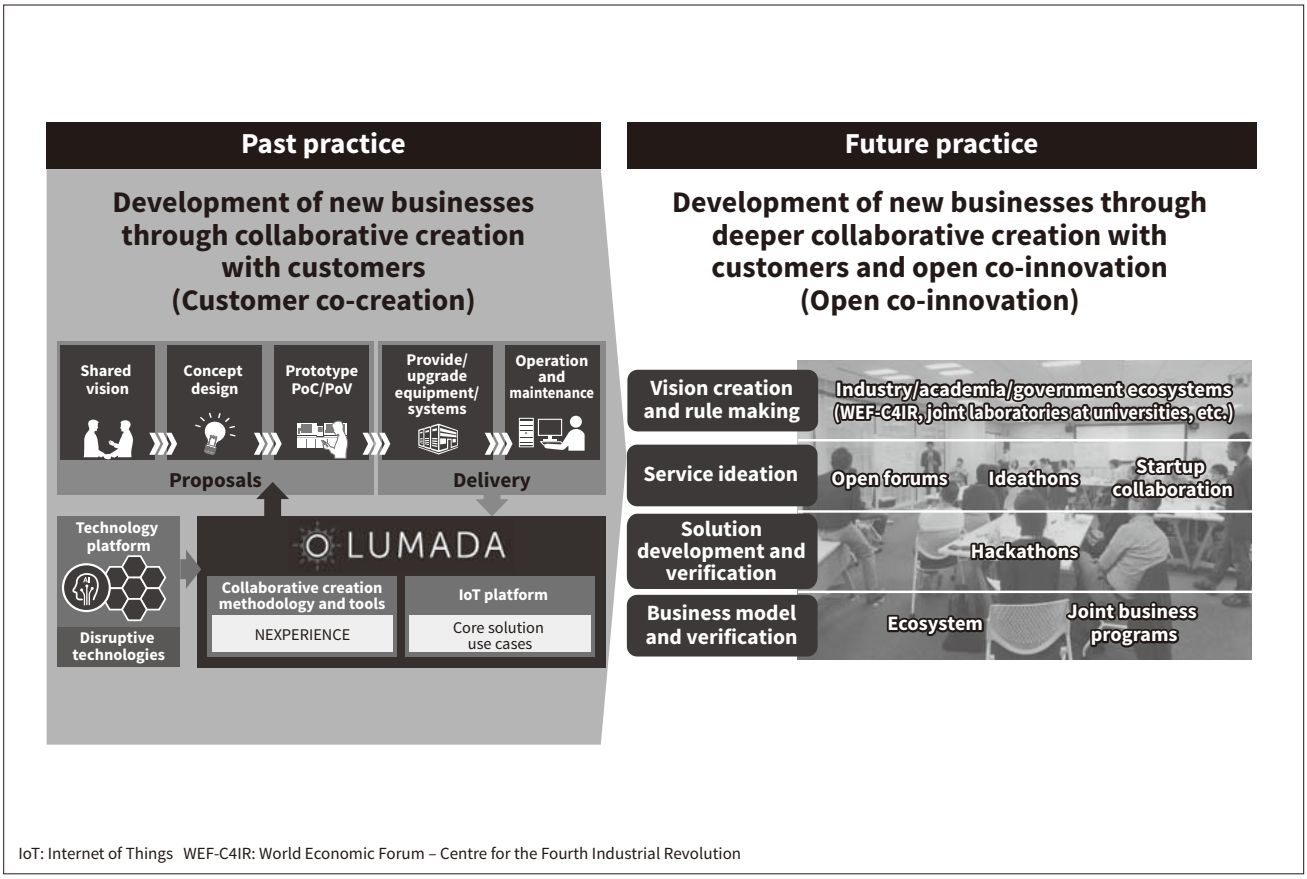
3. 2
AI-based Support System for Generating Innovative Ideas

Hitachi has developed a support system to accelerate creating innovative ideas that uses AI capable of voice recognition and making suggestions[(5)]. The system is used with the Lumada platform, which consolidates Hitachi's operational and information technologies (OT & IT) in one place. It is deployed at workshops that use NEXPERIENCE to devise service ideas, the purpose of the system being to use the knowledge accumulated in Lumada in producing innovative ideas that span different areas of business such as energy, industry, and finance. This support system will contribute to the creation of new businesses by encouraging workshop participants to create cross-industry ideas that go beyond the existing framework.

While Hitachi is being called on to further develop its Social Innovation Business to help overcome societal challenges, the difficulty with these challenges, given their complex nature, is how to come up with diverse solutions that extend beyond specific industries. In response, CSI has developed a support system that enables the development of ideas for the Social Innovation Business that combine different use cases from among those available on Lumada and encompass multiple industries.

This support system utilizes AI-based voice recognition to identify key terms relating to the issues of interest during workshop discussions. These are then used to offer relevant examples from the use cases in Lumada. These functions facilitate the generation of cross-industry ideas that combine different use cases, even in the absence of experts with knowledge of the different industries. When tested in-house at a workshop where the system was loaded with a subset of the use cases in Lumada, the proportion of the ideas generated during the workshop that spanned multiple industries was approximately double what it had been in the past. In the future, Hitachi intends to use this system to boost idea generation and to better train staff in collaborative creation.

Figure 2 — Enhancing Innovation
Hitachi is putting more emphasis on open co-innovation to help develop businesses in the respective growth areas of Hitachi and its customers.



IoT: Internet of Things WEF-C4IR: World Economic Forum – Centre for the Fourth Industrial Revolution

4. New Approach to Collaborative Creation in Preparation for the Coming Era

4. 1

Enhancing Innovation through Open Co-innovation

This section describes how Hitachi is enhancing innovation by adopting a new approach to collaborative creation in preparation for the coming era (see **Figure 2**).

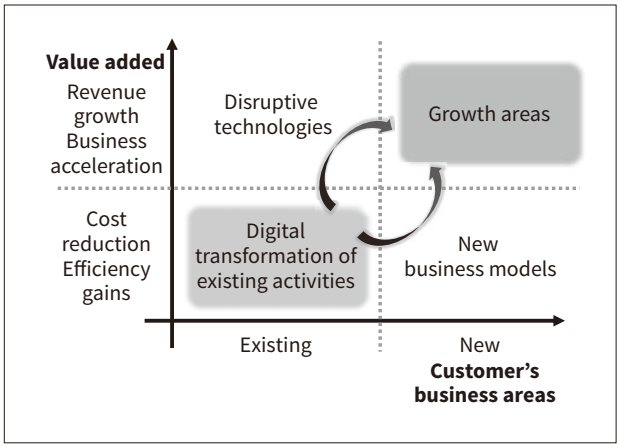
As noted above, past collaborative creation with customers has been successful at using NEXPERIENCE to identify opportunities for resolving challenges faced by customers and putting digital solutions and use cases into practice. However, while experience has been acquired in using digital technology to transform existing business activities, the challenge for the future is to achieve similar success in new growth areas (see **Figure 3**).

To help customers in areas of high growth, Hitachi is first of all deepening its involvement in collaborative creation with customers, working to improve its ability to offer solutions that combine OT, IT, and products based on understanding the customer's operations and the flow of money.

In tandem with this deeper engagement in collaborative creation with customers, Hitachi is also taking steps to develop new businesses through open co-innovation without limiting involvement to itself and its customers only. As shown in **Figure 2**, open co-innovation potentially encompasses all the various steps of developing a vision and formulating rules, generating service ideas, developing and testing solutions, and business modeling and running practical trials. In the case of creating a vision and making rules, Hitachi intends to engage in collaborative creation between industry and academia, including with the University of Tokyo and Tsinghua University in China, and to work with the Centre for the Fourth Industrial Revolution (C4IR) of the World Economic Forum (WEF). With regard to ideating service ideas and developing and verifying solutions, Hitachi has held ideathons and hackathons with invited participants from inside and outside the company to utilize open knowledge without being held back by the constraints of existing operations. For business models and practical trials, Hitachi is building ecosystems that utilize solutions and technologies from partners rather than only from Hitachi and the customer. The next section describes new initiatives that take advantage of local circumstances.

Figure 3 — Past Collaborative Creation with Customers and Future Challenges

Along with using digital technology to transform customers' existing activities, the challenge for the future is to contribute to growth areas.



4. 2

New Collaborative Creation that Takes Advantage of Regional Characteristics

In North America, Hitachi has opened a new building in Santa Clara, California[(6)]. Housing both Hitachi America, Ltd. and Hitachi Vantara Corporation, the new facility is accelerating work on digital solutions that enable industrial customers to optimize their operations and transform their business models, drawing on open collaborative creation with customers, academia, and other partners (see **Figure 4**).

Figure 4 — New Hitachi Facility on USA West Coast

The new facility houses both Hitachi America, Ltd. and Hitachi Vantara Corporation, and is being used to accelerate work on turning open collaborative creation into digital solutions.

In China, Hitachi has built on a collaborative relationship with Tsinghua University, signing a strategic joint venture agreement on the "Future-oriented Collaborative Innovation Scheme to Create a Super-smart Society in China"[7]. Together, they will extend vision creation and joint research into areas such as urban digitalization, healthcare, and energy, etc. Hitachi is also accelerating solution development and testing by participating in the ecosystems based around Zhongguancun in Beijing and Shenzhen.

At the new *Kyōsō-no-Mori* (Collaboration Forest) facility opened at the Central Research Laboratory, Hitachi aims to build a global innovation ecosystem that generates a large amount of value by combining a wider range of knowledge and insights from inside and outside the company, the objective being to create a prosperous and sustainable society that is human-centered with a high QoL. In anticipation of this, Kokubunji City and Hitachi signed a comprehensive partnership agreement to invigorate the local community through innovation creation in October 2018[8]. A joint project with the residents of Kokubunji City is now underway based on the theme of "connecting the community." One project is linking "agriculture," "people," and "food" with agricultural and livestock products such as vegetables harvested in Kokubunji city. Another project is trying to introduce electronic tickets and aims to create regional ties through an interface that bridges the distance between stores and customers.

5. Conclusions

This article has described what Hitachi is doing to create innovation through collaborative creation. In the next stage of evolution as a global research and development organization, CSI in 2019 is contributing to the global growth of Hitachi by taking its past involvement in collaborative creation with customers to a higher level and engaging with partners from inside and outside Hitachi to work on new ideas.

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