Digital Engineering
Digital Systems & Services

#Innovation Creation   #Co-creation and Open Innovation   #Generative AI   #IoT/Data Utilization   #Digital Solutions

1. Hitachi's Digital Engineering Solves Customer Challenges and Delivers Social Innovation

"Digital engineering" is defined at Hitachi as "Using the diverse technologies and data cultivated by Hitachi to solve customer challenges and deliver innovation for a better society. "

For over a century, Hitachi has been at the forefront of pioneering industries through cutting-edge information technology (IT), operational technology (OT), and products, helping to build the wide-ranging foundations of our society. In 2021, GlobalLogic became a member of the Hitachi Group. With its extensive expertise in digital technologies ranging from embedded software and operational services to applications that revolutionize customer experiences, and its agile execution approach, GlobalLogic has supported some of the largest global enterprises in creating innovative products and services that transform their businesses as well as the lives of their consumers.

By combining Hitachi's renowned quality and reliability in developing mission-critical products and systems with GlobalLogic's deep technological capabilities and agile execution approach, Hitachi is pioneering a unique form of design-led digital engineering.

Utilizing cutting-edge data science, generative artificial intelligence (generative AI), design methods, customer co-creation approaches, and domain knowledge across a broad range of industries, it comprehensively handles the end-to-end value chain from identifying customer challenges to developing, operating and monetizing next generation products and services. This helps it continuously address customer challenges and build a better society.

Digital engineering is the starting point for Hitachi's Lumada, which creates value from customer data and accelerates digital innovation.

In this section, we introduce five initiatives of Hitachi's digital engineering, including two case studies and three key methods and technologies essential for putting them into practice.

[01] Lumada Business Model (Framework for Co-creation with Customers) and Hitachi's Digital Engineering
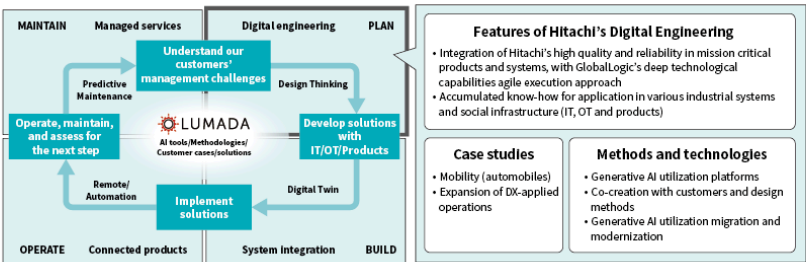

2. Digital Engineering for Improving Lifetime Value in the Mobility Field

The automotive industry has been undergoing significant transformation in recent years, and the integrated value of vehicle lifetime value (LTV) and in-car[*1] and out-car[*2] elements has become ever more important. Hitachi has leveraged the power of user experience design and chip-to-cloud digital engineering including GlobalLogic's capabilities to create new values across vehicles' entire lifecycles from development and manufacture, to sales, ownership, and maintenance. The specific details are as follows.

(1) Development and manufacturing

Hitachi enables next-gen software defined vehicle (SDV) development leveraging its rich SDV-related software development track record and engineering talents at a global scale.

(2) Vehicle sales: Hitachi closely collaborates with clients to create new sales experiences and sales models leveraging its experiences working with world-leading retailers and cutting-edge partner solutions.

(3) Ownership: Hitachi closely collaborates with clients to create new personalized services leveraging case studies and knowhow in new service incubation and data utilization projects across diverse industries including retail, finance and media.

(4) Maintenance: Hitachi enables more efficient maintenance operation and create value added services leveraging its advanced three-demensional (3D) modeling and data analytics technologies.

[02] Digital Engineering for Improving Lifetime Value in the Mobility Field
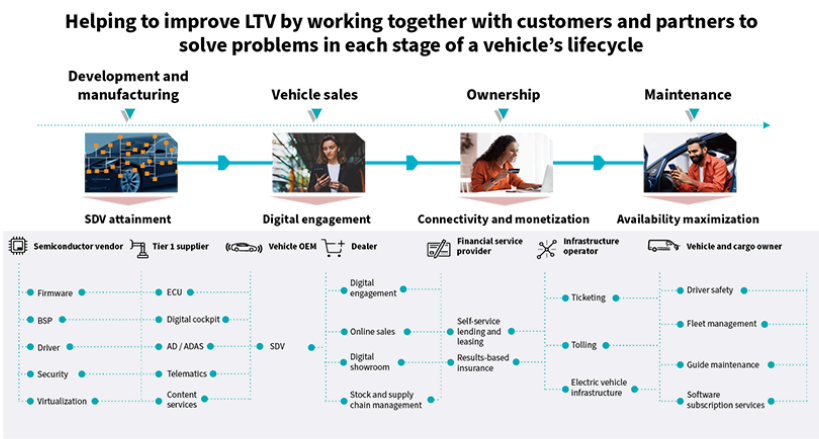
OEM: original equipment manufacturing
BSP: board support package
ECU: electronic control unit
AD/ADAS: autonomous driving / advanced driver assistance systems

*1 in-car: A general term for in-vehicle systems related to control and other electronic devices inside the vehicle, such as the power train.

*2 out-car: A general term for fields and technologies that are linked to locations outside the vehicle, such as mobile apps.
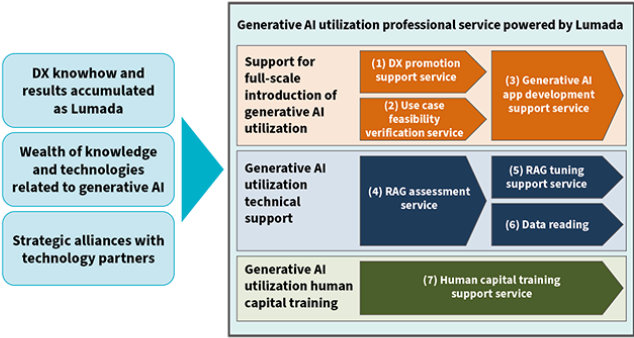
3. Expansion of DX-applied Operations Using Generative AI

The launch of ChatGPT* in 2022 and similar services focused attention on generative AI, and in 2023, many companies introduced platforms and trialed systems that leveraged their internal data. Then in 2024, generative AI started to be applied in actual work, and its scope of operations was expanded from previous indirect work such as document search and summary to supporting frontline workers in core operations and areas facing severe human capital shortages.

In this context, Hitachi announced its "Generative AI utilization professional service powered by Lumada" in July 2024. This service expands the operations in which DX can be applied by utilizing digital engineering*1.

The service addresses the following customer problems, (1) customers do not know the next step after introducing the platform, (2) customers want to leverage internal documents, but they are difficult to use without increasing their accuracy, and (3) utilization is limited except for certain employees. To overcome these challenges, the service supports the full-scale introduction of generative AI, and provides technical support and training of human capital.

As of July 2024, retrieval augmented generation (RAG) was typically being used as the technology for utilizing internal data. However in the future, as described in the August press release*2, the combined use and compartmentalization of industry-specific large language models (LLM) should enable more advanced inference and expand the range of applications in operations.

Generative AI utilization professional service powered by Lumada

* See the list of "Trademarks".

*1 https://www.hitachi.co.jp/New/cnews/month/2024/07/0722.html

*2 https://www.hitachi.co.jp/New/cnews/month/2024/08/0829a.html
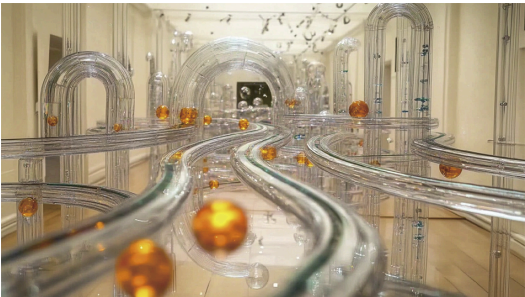
4. Accelerating Enterprise Value with AI

As many organizations are continuing to navigate the chasm between AI/GenAI pilots and enterprise deployment, Hitachi is already making significant strides.

GlobaLogic discusses the importance of grounding any AI/GenAI initiative in three core principles: 1) thoughtful consideration of enterprise objectives and desired outcomes; 2) the selection and/or development of AI systems that are purpose-built for an organization's industry, its existing technology, and its data; and 3) an intrinsic commitment to responsible AI.

Hitachi and GlobalLogic are addressing those principles with the Hitachi GenAI Platform-of-Platforms, GlobalLogic has architected this enterprise-grade solution to enable responsible, reliable, and reusable AI that unlocks a high level of operational and technical agility. It's a modular solution that GlobalLogic can use to rapidly build solutions for enterprises across industries as they use AI/GenAI to pursue new revenue streams, greater operational efficiency, and higher workforce productivity.

Accelerating Enterprise Value with AI - GlobalLogic

［04］ Architecting Value with AI

5. Customer Co-creation Approach as a Factor in Successful Digital Utilization

The speed of change has accelerated in modern society, and industrial structures are also shifting rapidly, giving rise to an age where there are no correct answers. The "Agile approach" is a project management technique that seeks to address these changes. Unlike the conventional waterfall model, this technique does not stick to a predetermined plan, but rather drives forward the project by responding flexibly to changes and updating requirements and specifications along the way. The key to this technique is to clarify the needs and dissatisfactions of the customer, but real feedback cannot be obtained just by conducting an interview. This is because end users do not understand what they want until they actually try using a service for the first time.

An important factor in successful digital utilization is to have the mindset of "Fail Fast & Learn Quickly." Hitachi Consulting Co., Ltd. takes a user-centric approach throughout the lifecycle of a project, from planning to verification, development, and operation. In this way, feedback from customers and stakeholders is reflected promptly in requirements and specifications, resulting in a successful project that creates new value.

End users do not know which services they actually want until they try them
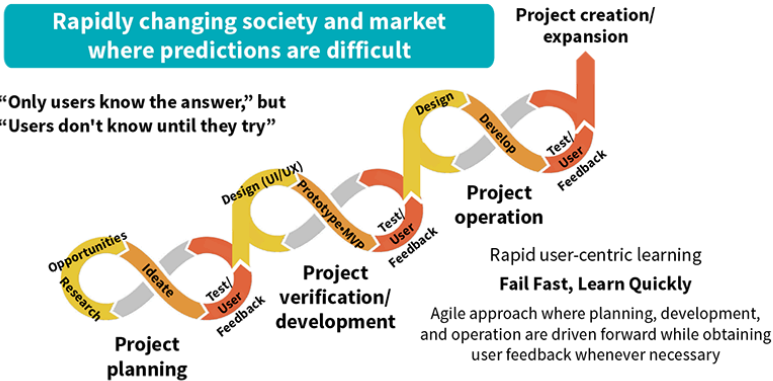
6. Total Offering of IT Modernization Utilizing Generative AI

In addition to digital transformation (DX) that creates value, corporate growth requires digitalization that includes the modernization of existing systems, such as core systems that must function correctly.

Hitachi has a long track record of developing and operating mission critical systems, as well as upstream experience of conducting strategic planning and execution in parallel from a customer perspective, while GlobalLogic has supported numerous digital transformations on a global scale. Hitachi will combine these results with generative AI and other modern technologies to deploy a total offering that delivers IT modernization both in Japan and across global markets.

This offering covers the entire process for IT modernization from strategic planning to execution. The strengthening of this process by generative AI enables the customer to start at any point, depending on the customer's situation. The offering helps customers achieve sustainable growth by storing and utilizing transaction logs and business logs, visualizing current conditions through advanced process mining, creating and executing a road map that takes the priorities of customers into account, and then receiving the corresponding feedback.

［06］ Overview of IT Modernization Total Offering
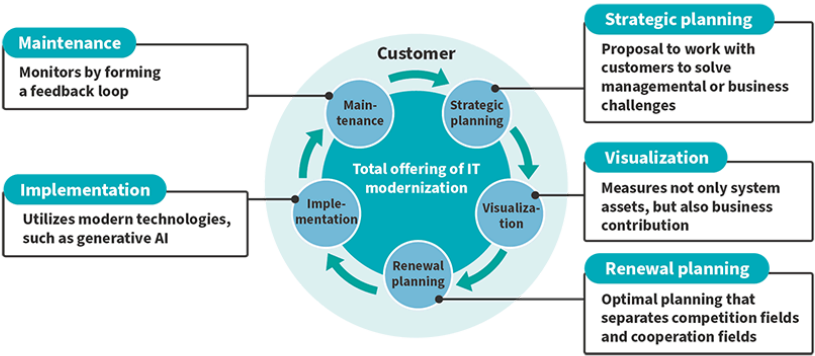
Hitachi Review

Hitachi Review is a technical medium that reports on Hitachi's use of innovation to address the challenges facing society.

The *Hitachi Review* website contains technical papers written by Hitachi engineers and researchers, special articles such as discussions or interviews, and back numbers.

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