

News Release

FOR IMMEDIATE RELEASE

Hitachi to Accelerate System Development Transformation with Generative AI *Started verification project in collaboration with JCB to standardize development using generative AI*

Tokyo, May 21, 2024 – Hitachi, Ltd.(TSE6501) is progressively developing and promoting the practical implementation of the Hitachi Group's Generative AI Common Platform with the aim of reforming the work styles and improving the productivity of software engineers and front-line workers, who are facing human resource shortages in a variety of industries. As part of the Generative AI Common Platform, a new development framework^{*1} has been developed to apply generative AI to the development domain of mission-critical systems.

This development framework is a development environment (development tool suite) that combines Hitachi's accumulated knowledge of mission-critical system development, such as enterprise core systems and social infrastructure systems, and generative AI. This framework enables us to customize the system to meet the needs and requirements of each customer and project. This aims to transform system development tasks through generative AI while ensuring high quality, and to solve the challenge of the software engineer shortage.

Hitachi will apply the framework to in-house as well as contracted development projects, and provide total support to companies working to improve the efficiency of system development by introducing the architectures and setups necessary for thorough utilization of generative AI, based on its knowledge and achievements. It has been confirmed in the preliminary in-house verification that by utilizing the framework, 70-90% of the application source code generated by the generative AI can be coded appropriately.^{*2}

Furthermore, Hitachi has started a verification project in collaboration with JCB Co., Ltd. ("JCB") to standardize application development using generative AI. If the verification results show that generative AI contributes significantly to development efficiency, Hitachi will promote co-creation toward the application development standard^{*3} tailored to JCB and its adoption to business operations.

^{*1}Development framework: framework or mechanism that pre-arranges commonly used functions, tools, and components in advance to streamline application development.

^{*2} Using sample subjects for evaluation, the quality of coding by the generative AI is evaluated under the assumption that detailed design has been completed in advance.

^{*3} Development standards: overall process, rules, and deliverable specifications for application development.

Comments from Hiroshi Minotani, Executive Vice President, Operations System Development Department, JCB

JCB believes that system development capabilities are directly related to business competitiveness, and sees the potential for generative AI introduction to lead to improvements in cost efficiency, speed, quality, and various other aspects. We hope that by confirming the effectiveness and challenges in collaboration with Hitachi this time, it will give momentum to the practical implementation.

About Generative AI Common Infrastructure

To accelerate value creation in Lumada business, Hitachi is promoting a company-wide AI transformation that thoroughly utilizes generative AI in all business operations, and is working on its application to system development and customer services. For example, in addition to advancing research and verification of code generation and testing efficiency in software development, and safety considerations, Hitachi is also focusing on upgrading customer services to support the work of front-line workers, such as call center agents and production facility maintenance workers. As a core platform to support these efforts, we are building a Common Platform for generative AI. This platform is an environment for promoting the

development and verification of generative AI in the Hitachi Group on a global basis, and we plan to incorporate the knowledge that has been developed and verified, as well as to gradually commercialize and provide it outside the company, starting with that whose results are recognized.

As the first step in releasing the functions of the Generative AI Common Platform, we will begin providing a framework that will transform system development operations and improve development quality and speed.

About Development Framework

1. High development quality for mission-critical systems based on the characteristics of generative AI

In order to develop highly specialized systems such as business applications using generative AI, it is necessary to have knowledge on how to create instructions called prompts to obtain high quality outputs. Specialists in both generative AI and system development, led by the Generative AI Center^{*4}, have brought their knowledge together to develop a proprietary software development tool suite and development process guide that enables ordinary engineers to easily master generative AI.

With a development tool suite and guide that takes into account the challenges of generative AI, such as hallucination, it is possible to maximize the effectiveness of the coding and testing processes of mission-critical systems, which require high reliability and stable operation, by combining generative AI and existing development tools in the right places and at the right time.

In the preliminary in-house verification, we confirmed that by inputting detailed design information, which is Hitachi's knowledge, the generative AI was able to generate application source code appropriately at a rate of 70-90%, resulting in high quality output. In the future, we will expand the application of generative AI to all processes of system development, and also apply generative AI from the viewpoint of system stabilization, such as system design and integration testing in consideration of system resilience, aiming to speed up the development of mission-critical systems.

^{*4} News Release (May 15, 2023) Hitachi Establishes New "Generative AI Center" to Accelerate Value Creation and Improve Productivity in the Lumada business by promoting the use of Generative AI
<https://www.hitachi.com/New/cnews/month/2023/05/230515.html>

2. Customizable based on customer and project characteristics

It is a development environment that can be customized flexibly and securely based on the diverse needs of customers and the specifications and characteristics of their projects. Specifically, in addition to Microsoft Azure OpenAI Service and GitHub Copilot, open source LLM^{*5} can also be used, allowing customers to select and use the most appropriate model and service of generative AI in line with their project development criteria. This allows you to select and use the most appropriate generative AI models and services according to your project's development criteria. In addition, on-premise and hybrid cloud environments are supported, and customers' important data can be stored in an independent environment for each project, ensuring secure utilization. Furthermore, the standard RAG^{*6} architecture is implemented and can be customized to customers' business operations and project-specific information to generate responses using unique knowledge.

^{*5} Open source LLM: LLM that allows data, architecture, and learning methods to be released, reused, modified, and redistributed free of charge.

^{*6} RAG: Retrieval-Augmented Generation, a technology to improve response accuracy by combining LLM with external information retrieval.

Future Initiatives

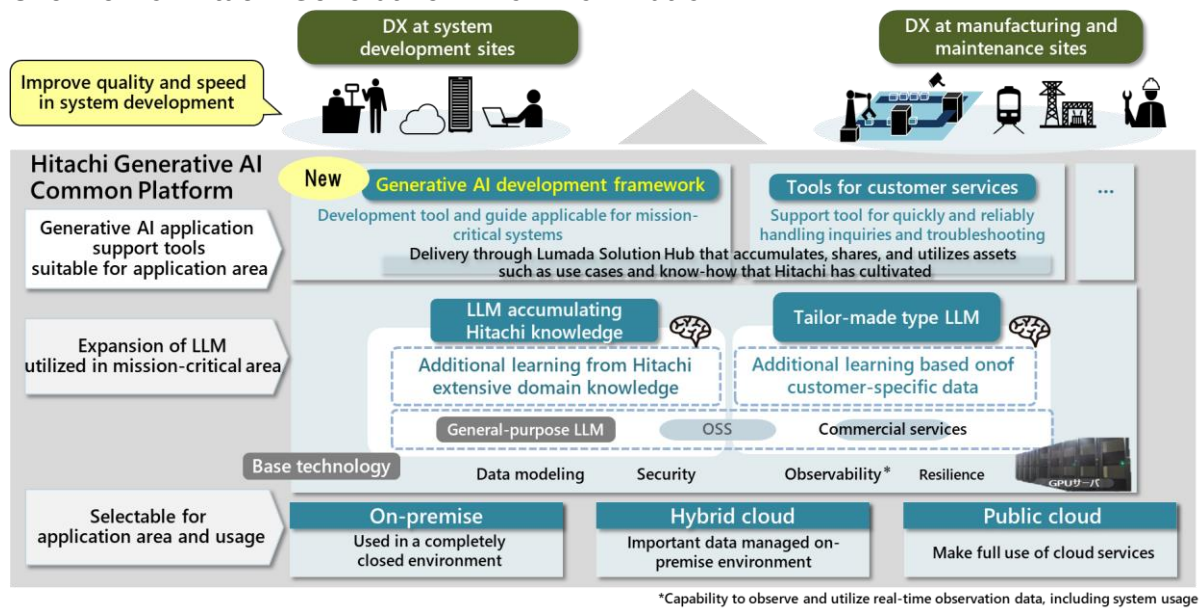
In the Generation AI Common Platform, Hitachi will promote the application to both internal and external projects and functional enhancement of the framework, as well as the expansion of tools for customer services. In addition, Hitachi will adopt the "Platform of Platforms"^{*7}, a

platform architecture for integrating enterprise-grade AI solutions announced by its US subsidiary GlobalLogic, and strengthen alliances with various partners. We will continue to strengthen the LLM in stages, including the development and verification of LLM that has learned Hitachi's unique knowledge in IT x OT.

For companies promoting business DX using generative AI, Hitachi will provide tools and usage environments through Lumada Solution Hub and other means, as well as total support for solving DX challenges.

*7 GlobalLogic News Release (April 8, 2024) GlobalLogic Announces 'Platform of Platforms' for Enabling Enterprise-Grade AI. <https://www.hitachi.com/New/cnews/month/2024/04/240409.html>

Overview of Hitachi Generative AI Common Platform



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About Hitachi, Ltd.

Hitachi drives Social Innovation Business, creating a sustainable society through the use of data and technology. We solve customers' and society's challenges with Lumada solutions leveraging IT, OT (Operational Technology) and products. Hitachi operates under the 3 business sectors of "Digital Systems & Services" – supporting our customers' digital transformation; "Green Energy & Mobility" – contributing to a decarbonized society through energy and railway systems, and "Connective Industries" – connecting products through digital technology to provide solutions in various industries. Driven by Digital, Green, and Innovation, we aim for growth through co-creation with our customers. The company's revenues as 3 sectors for fiscal year 2023 (ended March 31, 2024) totaled 8,564.3 billion yen, with 573 consolidated subsidiaries and approximately 270,000 employees worldwide. For more information on Hitachi, please visit the company's website at <https://www.hitachi.com>.

Information contained in this news release is current as of the date of the press announcement, but may be subject to change without prior notice.
