News Release

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Development of technology for enhancing resilience of the manufacturing industry supply chain to natural disasters and pandemics

Visualizes procurement risks by using generative AI to extract insight, aiming for more efficient risk management

Tokyo, March 14, 2025 – Hitachi Ltd. (TSE: 6501; hereafter "Hitachi") has developed "deep insight inferencing" technology aimed at making the manufacturing industry supply chain more resilient to natural disasters and pandemics. When part supply information such as the type or model of a part, its material, and company supplying it, along with corporate and other information available on a website, is fed into a generative AI model, this technology is capable of inferencing with high precision information about the manufacturing site that up to now has been difficult to discover (Figure 1).

A verification trial of this technology inside the Hitachi Group demonstrated the ability to inference supplier manufacturing site information with greater than 85% accuracy. Up to now, when a parts supply risk incident occurred such as an earthquake or typhoon, collecting and narrowing down the huge amount of information about manufacturing sites from which parts are procured had to be done by human tasks; but this technology reduces that manual work.

Following up, Hitachi in collaboration with Institute for Digital Observatory, the University of Tokyo[*1,2] will incorporate early warning signs of risks that may impact the manufacturing industry, will visualize procurement risks, and will seek to improve risk management efficiency, thereby contributing to greater corporate supply chain resilience.

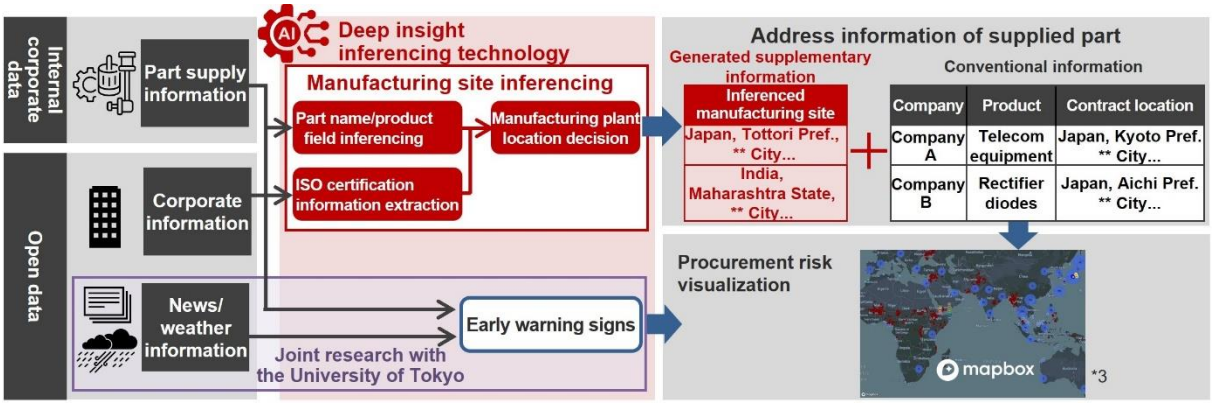

Figure 1. Overview of manufacturing industry supply chain risk[*4] mitigation. The effectiveness of manufacturing site inferencing was demonstrated in this verification trial

Details of these results are to be announced at the 2nd Open Forum of the Institute for Digital Observatory scheduled for March 17, 2025 on the Hongo Campus of the University of Tokyo.[*5]

*1 An initiative that will draw up a Grand Design for a resilient society by backcasting from a vision of society and economic activities desired by 2050, and on that basis provide the government and industrial world with analysis results, policy proposals and advice, aiming for social implementation. https://inst-do.adm.u-tokyo.ac.jp/ [in Japanese]

*2 News release dated April 4, 2023, "Establishment of Institute for Digital Observatory, the University of Tokyo—Starts joint research with Hitachi, Ltd. aiming to realize a resilient society and economy" [in Japanese]

*3 Mapbox: https://www.mapbox.com/about/maps
OpenStreetMap: https://www.openstreetmap.org/about [in Japanese]

*4 The risk that the operations of companies or organizations involved in the provision of products or services will be impacted by a natural disaster, accident, cyberattack, or other threat, cutting off supply.

*5 https://inst-do.adm.u-tokyo.ac.jp/news/20250213.html [in Japanese]

Background

Natural disasters, pandemics, and geopolitical strife are among the factors behind rising uncertainty in today's world. Given this reality, it is increasingly important for the manufacturing industry with its multiple suppliers to manage supply chain risks, thereby boosting resilience. Addressing such needs, since April 2023, Hitachi and Institute for Digital Observatory, the University of Tokyo have together been advancing initiatives aimed at building a more resilient society, by observing and analyzing in the form of digital data multiple elements that impact the supply chain, toward early discovery and response to early warning signs.

Determining supplier manufacturing sites using deep insight inferencing technology

Hitachi has now developed "deep insight inferencing technology," able to extract insight beyond human capabilities, by using generative AI to collect and store internal corporate data and open data in real time, then performing association and inferencing. Using this technology, it was attempted to inference the manufacturing sites of key suppliers for risk visualization, toward making the manufacturing industry supply chain more resilient. As specific steps, first the location and parts information obtained from contracts at the time of procurement was converted to product codes and ancillary information based on the product code standards[*6] used for product identification, classification, and management. Next, using generative AI, candidate manufacturing site information was extracted from unstructured open data such as official corporate websites, ISO certification information,[*7] and map information. Then intermediate lists of this various information were processed to ensure consistency and accuracy, enabling high-precision inferencing of supplier manufacturing site location at the latitude and longitude level (Figure 2).

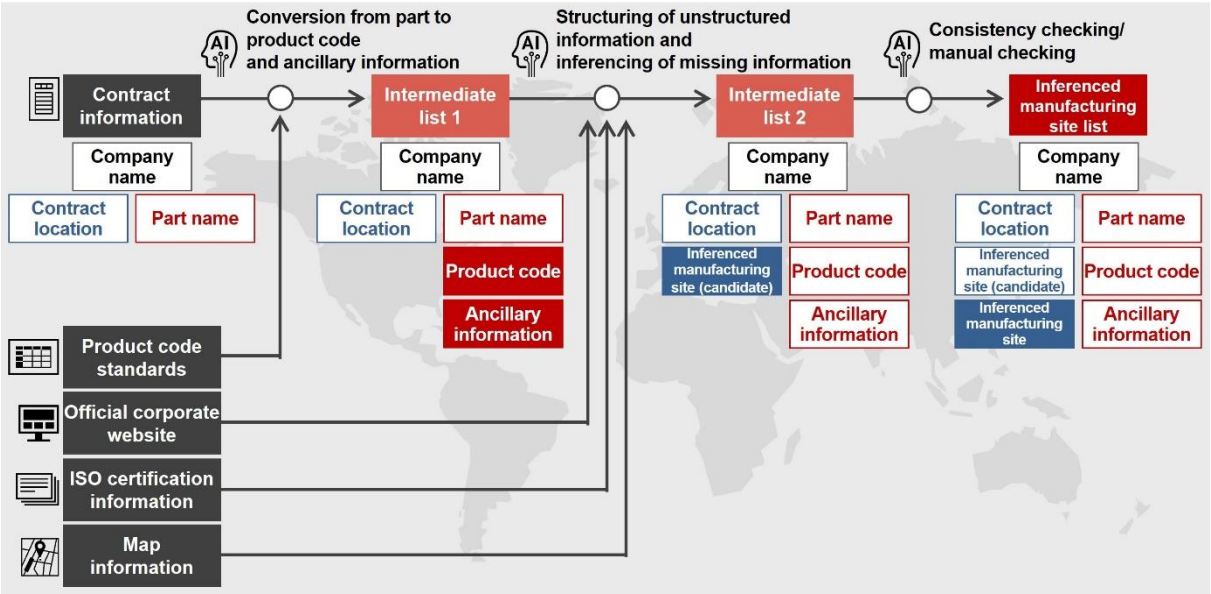

Figure 2. Method of manufacturing site inferencing

Evaluating this method for suppliers of multiple products in the Hitachi Group, inferencing accuracy above 85% was achieved.[*8] With this technology, by overlaying, for example, information about places where severe vibration in the grounds is expected when a huge earthquake occurs, or forecasts of rivers that may flood in a typhoon, or news about pandemics or geopolitical trouble, it should be possible to extract from the vast number of supplier manufacturing sites those that are subject to supply chain risk, and to augment inventories, investigate alternative suppliers, or take other action based on assessments of the impact on delivery delays.

*6 The codes and rules used for product identification, classification, and management. These facilitate the processes of product identification, inventory management, and sales data analysis.

*7 Certification that a company's own management system, or the quality of provided products and services, for example, conform with international standards.

*8 The averaged percentage of information matching when comparison was made of use cases in multiple fields between information collected manually by procurement division personnel, and information inferenced by the technology using open data and generative AI. This is above the currently expected level of operations support by generative AI.

Looking ahead

Hitachi and Institute for Digital Observatory, the University of Tokyo will continue with the collaborative research, aimed at achieving visualization of supply chain risks by integrating this technology with various risk information and early warning signs. In addition, Hitachi in collaboration with its partners and government agencies is seeking to create an ecosystem and promote social implementation of supply chain risk management systems and services, thereby contributing to supply chain stability while addressing diverse societal risks.

About Hitachi's new supply chain platform service

Based on the cloud service TWX-21, a platform for intercompany transactions that serves approximately 87,000 customers, Hitachi is responding to the uncertainties in society and rising ESG awareness by providing a new platform service that improves resilience and agility of the entire supply chain.
Website: https://www.twx-21.hitachi.ne.jp/en/index.html

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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.

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