Engineering Business (JFE Engineering Corporation)

DX is an important growth engine for the innovation and acceleration of JFE Engineering's business. By introducing digital technologies including AI and IoT, we are boosting business productivity while using our data from many years of infrastructure construction and operations to transform the engineering business model through more advanced decision-making.

The strength of "people" is indispensable for DX to succeed. We are providing training that promotes self-growth by raising all employees' digital literacy and ability to identify issues, while aiming for a continuously innovative corporate climate that creates workplaces where employees can make maximum use of their abilities.

Tateki Koyama **Managing Director** (Senior Managing Director of **DX Headquarters Sector)**

DX Strategy and Policy >>>

The Seventh Medium-term Business Plan designates four priority areas: Waste to resource; Combined utility service; Infrastructure; and Carbon neutral, and a policy for business expansion. We believe that digital transformation is essential for the achievement of this policy, and have positioned DX as an important initiative to support all business areas.



To accelerate these initiatives, we established a DX Headquarters in fiscal 2022. The DX Headquarters comprises IT engineers who build and maintain the internal IT environment and provide cloud platforms, data scientists who analyze data, control system engineers who implement data-collecting functions and new functions using AI in our products at plants, and DX promoters who work together with business divisions to push DX themes forward. We are working toward the "transformation of existing businesses," "creation of new businesses," and "innovative productivity enhancements," while emphasizing "digital human resource development and cultural reforms" and "optimizing a digital platform" to create an environment for DX promotion



Using generative AI for innovative improvements in productivity

JFE Engineering has been utilizing generative AI since the release of Pla'cello xChat®, text generative AI service for internal use, in September 2023 Regarding generative AI as a key technology for improvement in business operations, we have established an internal working group engaged in the following three activities for practical use of generative AI:

Providing an environment for safe and easy use of generative AI

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We have internally developed and provide Pla'cello xChat® and APIs for development of internal systems. With Microsoft's Azure OpenAl and Amazon Web Services' Amazon Bedrock, all employees can easily use generative Al to create documents without worrying about leaks of confidential information or personal data. Additionally, the usage guidelines inform users of important considerations when using generative AI to prevent the infringement of intellectual property rights and the generation of false information.

Technical exploration to leverage generative AI for improvement of business operations

We are working to improve business operations using generative AI while incorporating user requests. We aim at establishing 2 technologies for using generative AI in a variety of domains, such as developing chatbots to respond to inquiries about internal information including company policies and regulations.

Promotion of daily use of generative AI in business operations through introduction of its useful tips

We are promoting the daily use of generative AI by showcasing use cases on the dedicated portal site and holding workshops 3 including hands-on training for business divisions and branch offices. As of December 2024, over 1,600 employees-approximately 45% of all employees-were regularly using Pla'cello xChat® in daily work.

The scope of application in actual business operations is expanding. By combining generative AI with conventional OCR* technologies to extract data from documents such as guotations and specifications, we successfully reduced the workload for comparing documents by 70%. We also expect more effective utilization of underutilized documents including equipment specification sheets and manuals. Going forward, we aim to expand these benefits by linking to Pla'cello®, internal data analysis platform, and implementing multimodal capabilities that include images and videos

* OCR (Optical Character Recognition): Technology that recognizes text portions of image data and converts it to text data



Information Technology Awar

Estimates, specification sheets

AI-OCR extracts data from estimates and specification sheets

Winner of 42nd Information Technology Award (transformation category)

JFE Engineering was selected as a recipient of a Fiscal 2024 (42nd) Information Technology Award (transformation category) by the Japan Institute of Information Technology

We were recognized for our various initiatives toward institutionalized reformation, including business transformation, increased efficiency in operations, and creation of an IT/DX platform. initiatives that have continued to steadily produce results



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JFE Engineering dedicated DX website

We have set up an official dedicated website to introduce DX initiatives. Please visit the site, which includes a message from the CEO and introductions to our DX strategy, solutions, and latest initiatives.

the URL below or QR code.

https://www.ife-eng.co.ip/dx/en

The site can be accessed via

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🔊 Initiatives to transform existing businesses

Using DX to improve efficiency in design operations for overseas bridge construction

JFE Engineering is promoting DX in a design process using BIM*¹ with the aims of increasing efficiency in design operations in projects and strengthening our international competitiveness.

Using a three-dimensional model creation tool's no-code programming function, we have achieved a parametric design*² method with a BIM system in overseas bridge construction. Applying this technology in overseas bridge construction projects makes it possible to put design information previously managed in duplicate in two-dimensional diagrams and the three-dimensional models by BIM into a single BIM system, significantly increasing operational efficiency. In addition, using the data of accurate parts and material shapes taken from BIM to order materials has improved the yield on materials to 89% from 85% and reduced both costs and CO₂ emissions.

Going forward, we aim to develop this technology for other processes beyond the design area and use BIM across the entire project life cycle to achieve more creative and efficient operational processes.

- *1 BIM (Building Information Modeling): A method of centrally managing a structure's shape and attributes in a three-dimensional model for use in design, installation, and operation
- *2 Parametric design: A design method that automatically creates shapes by defining dimensions as variables in 3D-CAD

Energy management systems in the electric power business

JFE Engineering has developed and operates a system in which electric power generated at renewable energy power plants built by the company or procured from other companies is provided to retail customers. The Supply and Demand Operation System automatically creates and provides plans to maximize profit by taking into account the balance between customers' electricity demand and supply. The ESP System minimizes electricity generation and procurement costs in an integrated, multi-site energy network service that provides electricity and heat (steam and hot water) to customers' multiple plant locations. The EMS System controls the charging and discharging of electricity to and from a storage battery within the customer's plant to offset spikes in usage during peak hours and predicts solar power generation volumes to optimize charge and discharge plans for storage batteries installed in solar systems. By maximizing usage of digital technologies, we are refining these systems and linking their operation both to use energy more efficiently and to strengthen business competitiveness.

We are also building an environment that makes it possible to calculate revenue and expenses from transaction data collected by the Supply and Demand Operation System and to confirm on a dashboard daily revenue and expenses at the retail electricity business. Displaying this data on large monitors in the head office will raise awareness of profitability among all employees and maximize business performance.





Creating new businesses

Expanding scope of pipeline maintenance management using Panacea® pipeline and facility maintenance and inspection system

Pipelines buried under public roads are distributed over a wide area, and their maintenance involves a huge amount of information. Maintenance was previously managed with paper documents, but papers could become scattered or lost and needed information could not quickly be retrieved. JFE Engineering is addressing this issue by providing the Panacea® mapping system with location and maintenance information to pipeline operators. The system is a cloud service for the efficient maintenance of facilities like gas pipelines and water pipelines. Interfacing with a map allows the positional relationship between facilities and related information to be understood visually, documents accessed quickly, and the affected



🔊 Building a digital environment

Zero trust security initiatives

In response to increasingly diversified work styles including remote work, JFE Engineering is striving to build an information and communications technology (ICT) environment that allows employees to work securely anytime and anywhere. As part of this effort, in fiscal 2023, we became the first JFE Group company to introduce zero trust security, a security approach that takes measures without automatically trusting all network accesses, both internal and external. This initiative has achieved the following three benefits:

 I Enhanced functionality and convenience when employees use ICT systems and networks
 I Ability to install new systems and add business locations to the network quickly to increase agility in business development
 I Minimized risks with upgraded network security design

Introduction at major locations in Japan was completed in fiscal 2024, making it possible to centrally manage information including telecommunications content from every location and mobile client connection information. This arrangement expedites the analysis of causes when a failure occurs, greatly increasing maintenance efficiency. In addition, with the migration from previous remote access environments that had a high risk of being breached, we have achieved a lighter workload during emergencies and stronger security. We intend to roll this out successively at locations and Group companies in Japan and overseas.

