

02 Engineering Business

Advanced Engineering with ICT—Creating and “*Ni-na-u*”* the Foundation for Life Powered by Manufacturing and Service Capabilities

* “*Ni-na-u*” is a Japanese word meaning supporting and remaining responsible.

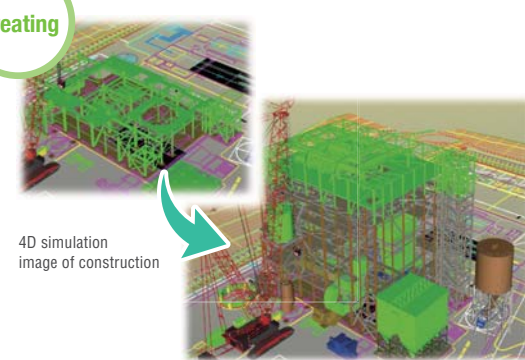
Atsushi Okamoto Senior Managing Director

Our mission is to provide solutions to social issues through planning, designing, building and operating infrastructure supporting people's life and industries. We have a wide range of businesses such as waste-to-energy plant, water treatment plant, renewable energy power generation plant and bridges. As privatization of public services is requested, we are actively expanding “*Ni-na-u*” business in addition to creating social infrastructure. Advanced technologies such as IoT, big data analysis and artificial intelligence (AI) are key drivers for creating and “*Ni-na-u*” the foundation for life. We make the best use of such advanced technologies for state-of-the-art infrastructure business.

Creating the Foundation for Life

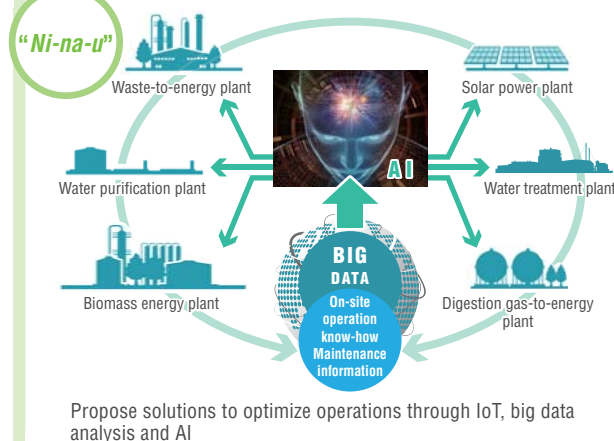
“*Ni-na-u*” the Foundation for Life

Creating



EPC: Actively utilize ICT in fields of engineering, procurement and construction

“*Ni-na-u*”



Propose solutions to optimize operations through IoT, big data analysis and AI

Two platforms supporting “Creating” and “*Ni-na-u*”

Global Remote Center (GRC)



Pla'cello data analysis platform



Pla'cello
= Plant + Cervello
Italian for “brains”



Pla'cello®

Data analysis platform that does not require specialized IT knowledge

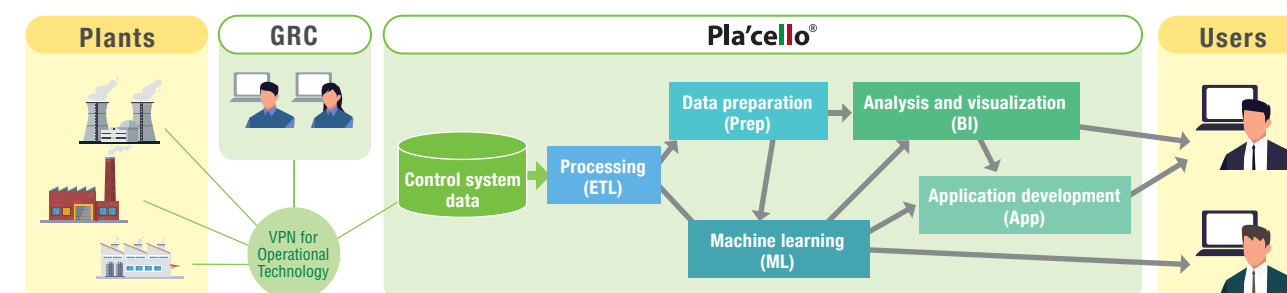
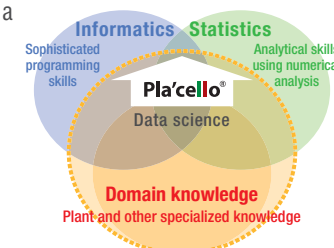


The Global Remote Center (GRC), which opened in March 2018, collects customers' plant operation data and provides services including remote plant monitoring, operational support and maintenance.

The Pla'cello data analysis platform, which allows analysis of a plant's photo and time-series data, was built and started operating in November 2018.

In general, the use of AI and big data is said to require knowledge of informatics, statistics and domain knowledge in a particular field.

The Pla'cello makes it possible to analyze data to detect signs of abnormalities and predict demand without advanced knowledge in informatics or statistics. This permits a reduction of the amount of time required for data analysis by up to 90%. Using Pla'cello, we plan to increase the number of internal engineers engaged in data analysis to 300 by the end of fiscal 2020.



Use of Pla'cello® is spreading

■ Full automation of a waste-to-energy plant

Because the operational status of a waste-to-energy plant changes minute by minute depending on the waste being used as fuel, an operator needs to intervene manually several dozen times each day for stable operations. Using AI image recognition of the state of combustion and systemizing the intervention operations of a skilled operator, we have succeeded in Japan's first full automation of a plant so that no manual intervention is required.



Before automation (manned)
Operators are constantly monitoring and engage in manual operations as needed.



After automation (unmanned)
In place of operators, AI determines the necessity of intervention.

■ Automation of bolt installation inspection in bridge construction

On-site bridge construction uses many bolts, and the inspection of their installation is conducted visually. Using AI image diagnosis, incorrect installation of bolts, including having washers backwards, can be detected with a high degree of precision. Inspections can be carried out in roughly 1/10 the time previously required.

Is this the washer's front or back? Can you tell?



Proper installation

Washer is backwards
Improper installation

Promoting familiarity with data analysis and application development

JFE Engineering holds “ideathon” and “hackathon” events using Pla'cello. These events incorporate agile development with a sense of speed and mutual voting to raise participants' awareness. Through these events, participants can experience idea creation and application development and learn basic AI skills.



Participant's voice

My idea was to measure happiness by smiles to create a brighter company overall. I was amazed that by using AI to measure happiness, in just one day, we were able to create an application that measures the degree of a smile from a smartphone photograph. I'm sure that if everyone in the company becomes familiar with the easy-to-use development environment, significant operational reforms can be achieved.

Koji Yoshii
Manufacturing Process Section, Tsu Works, Infrastructure Engineering Sector

JFE Voice!