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Success case **SEKISUI**

SEKISUI

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NTT DATA
Trusted Global Innovator

SEKISUI S-LEC

Recent technological advancements are having such a significant impact on manufacturing that many are comparing it to pivotal past events such as the running of assembly lines using electricity. This new turning point, named by specialists the Industry 4.0, is a result of how new technologies such as data analytics, computational sciences, machine learning, advanced robotics and automation, are transforming the sector to a predominantly digitalized one.

Pioneer companies like SEKISUI S-LEC B.V. are investing in these technologies and incorporating them in their growth strategy knowing that this will enable them to grow exponentially in the near future.

THE CLIENT

SEKISUI S-LEC B.V. is an international company based in the Netherlands that specializes in the glass interlayer technology for the automotive and the architectural industry. It is part of SEKISUI CHEMICAL CO. LTD., a market leader with over 27.000 employees worldwide and over 70 years of experience in producing a wide variety of plastic products for industrial and consumer applications. Based in Japan, SEKISUI uses unique fine particle, adhesion and precise synthesis technologies to develop high-performance and intermediate materials for a wide variety of fields such as electronics, mobility, construction and infrastructure materials, industry, etc.

As an innovative and forward-thinking cluster, the SEKISUI CHEMICAL Group plans on investing in corporate activities that will stimulate digital transformation, with the intention to help create a more sustainable society while also ensuring continuous growth.



THE CHALLENGE

A comprehensive digital transformation strategy implemented at a group level is always a challenging process. While the company is remodeling all the business activities and processes, the level of production must sustain its normal flow. As a result, several challenges surfaced such as having to **control production line attributes over different variables in the surrounding environment and also predict certain behaviors of the manufacturing process.** The challenge was not only to accurately predict operations but also quickly adapt to unforeseen changes in the production conditions and maintain the level of production quality. The solution to this challenge was to build a quality management system that will increase efficiency and make the process more agile.





THE SOLUTION

everis NTT DATA worked side by side with **SEKISUI S-LEC B.V.** to develop a predictive **quality management platform** that matches the group expectations and technological qualifications of the Industry 4.0 revolution. Considering the complex characteristics of the industrial ecosystem and risks of an innovative project, we used the following project management methodology:

- Structure the project in a series of well-defined phases that require GO / NO-GO review meetings with a steering committee deciding on whether to proceed to the next stage or not.
- Use an agile approach which included daily meetings, between the everis NTT DATA unit and the **SEKISUI S-LEC B.V** engineers, and weekly review meetings between the project management teams.
- Consult with academic and university research experts in artificial intelligence on the best practices and state-of-the-art industry solutions, algorithms and methodologies that have been used in similar projects.



The teams began by conducting a **feasibility study and creating an MVP** for a pilot production line.

The main objective was to build an end-to-end, scalable, user-friendly and transversal prediction and management solution leveraging cutting-edge AI technologies on top of an enterprise analytics platform considering operational constrictions.

During the **exploration and feasibility phase**, the data from the sensor was analyzed in order to verify that it can be used to develop the future model. This is a common practice in industrial control engineering, because of the wide range of sensors and standards of the sensory data acquisition. In order to successfully process the data, the teams went through two stages:

- Studying the feasibility of the process modeling: number of available variables, number of input data records for each of the different possible final states, required precision.
- Analysing the data that was obtained from the sensor: data quality, data validity and consistency assessment (historical records, relevant variables, timestamps, etc.).

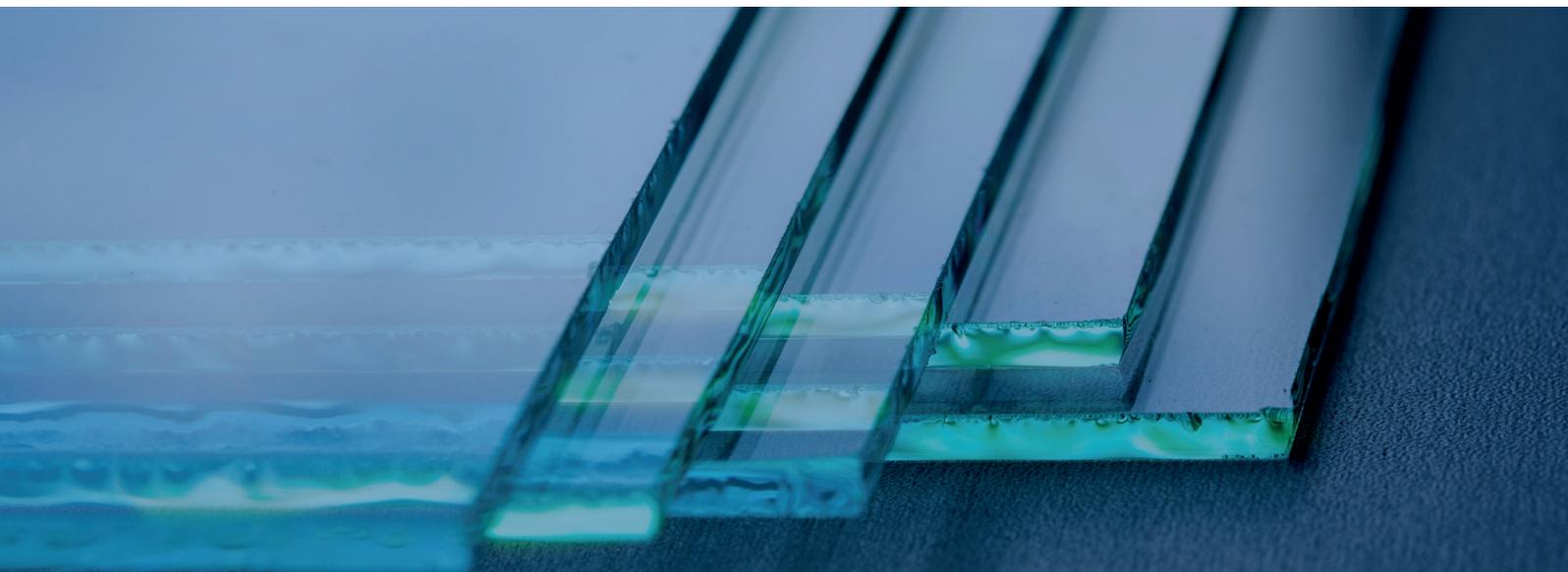
The second phase of the project was dedicated to the **model viability assessment**. During this stage the teams evaluated the viability of the developed model and corroborated it in an offline mode (not connected directly to the sensor) during which the everis NTT DATA specialists performed environments tests.

Finally, during the **deployment phase**, the platform was implemented and used to visualize predictions in a real-time dashboard.

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We are very happy with how the collaboration with the everis team went and we're convinced that this will surely extend our close partnership in the future. On our side, the project was mainly to show a PoC of the technology and investigate the potential benefits. Considering the outcome of this project, the technology we've implemented has proven to be beneficial for us in our continuous search to increase the quality of our products. ”

Martin van Neer, Senior Process Engineer
from SEKISUI S-LEC B.V.





THE RESULT

As a result, more than 200 sensor data items have been examined and among them, relevant attributes were identified. The **prediction accuracy of the developed model reaches 94%** (50% improvement over baseline). The process capability index (CPK), a measure of the ability to produce output within the specification limits, was increased a 34%. In addition, the use of automatic control techniques based on the model's predictions can boost the enhancement to a 50%.

This approach represents a **competitive advantage in the sector that will maximize revenues and profits** within current high-competitive and low-margin markets. Meeting high-quality standards can also reduce both internal and external costs. Some of the most common causes of internal costs are often related to shortages, waste, or delays while external costs arise after delivery through recalls and warranty costs.

SEKISUI S-LEC B.V. and everis NTT DATA will continue working together to **evolve the solution with new functions and complex characteristics** that will enhance prediction accuracy while also adapting it to a wide variety of manufacturing process scenarios.

WHY EVERIS NTT DATA?



The client aimed to identify an effective method to predict the quality of a product according to the condition of the production line, environment etc. Given the complexity of manufacturing and current Industry 4.0 context, the client needed a provider with extensive knowledge in both the industry and new technologies. To tackle this situation, **everis NTT DATA's advanced technological capabilities in terms of artificial intelligence, real-time analytics and enterprise data platforms allowed us to build a pragmatic, tangible, solid and cutting-edge solution** far from theoretical approaches or minimum viable product built by new startups.

From everis NTT DATA's point of view, initiatives related to Industry 4.0 system require comprehensive solutions tailored to the specific needs and challenges of the industrial environment and should be based on three basic pillars:

- Advanced Analytics Methodology (MLOps) and Algorithms for Industrial Processes.
- Big Data Architectures (structured + process + unstructured data).
- Operational methodology (monitoring + evolution + continuous improvement).

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