



INTERNATIONAL PAPER IMPLEMENTS ALTAIR AI

MACHINE LEARNING MODELS BUILT IN
ALTAIR® AI STUDIO™ DISPLAY REAL-TIME DATA
IN ALTAIR® PANOPTICON™ DASHBOARDS

About the Customer

International Paper (NYSE: IP) is a global provider of renewable fiber-based packaging and pulp products, and one of the world's largest recyclers. Headquartered in Memphis, Tennessee, the company employs approximately 40,000 people globally who are committed to creating what's next. International Paper serves customers worldwide, with manufacturing operations in North America, Latin America, North Africa, and Europe.



The insights provided by Altair software have been invaluable in improving product quality and consistency.”

Andrew Jones
Senior Engineering Fellow,
Data Scientist
International Paper

Their Challenge

IP's analytics team was charged with developing ways to apply AI process optimization, predictive machine maintenance, material waste mitigation, and product composition and quality issues throughout the paper manufacturing process.

For example, the team sought to predict material composition based on various material characteristics and process parameters. One important measure of quality for paper products is material porosity. The team believed they could develop machine learning models to predict porosity and prescribe adjustments to manufacturing equipment to improve quality and consistency and reduce waste.

Another use case involves identification of root causes for high and low fouling rates on the heat exchanger surfaces of recovery boilers, which are crucial components of the chemical recovery process in pulp mills. Recovery boilers combust "black liquor", a mixture of lignin, hemicellulose, water, and inorganic chemicals generated during the pulping process, to recover chemicals and produce steam, which is used to generate electricity and power various processes within the pulp mill.

Further, the team was asked to develop a method for providing real-time guidance to machine operators about process conditions combined with recommended setting produced by machine learning models. With the right information presented in the right way, plant operators people can vary production parameters, including temperature, water content, process speed, and other critical settings to maintain high levels of output quality and consistency.

Our Solution

The IP team selected Altair® AI Studio™, Altair® AI Hub™ and Altair® Panopticon™ — part of the Altair® RapidMiner® AI and data analytics platform — to develop their solution.

- [Altair AI Studio](#) enables IP process engineers to design and prototype highly explainable AI and machine learning models.
- [Altair AI Hub](#) connects software programs, pulls data from anywhere, and enables better decision-making.
- [Altair Panopticon](#) enables engineers to design and deploy dashboards to visualize real-time and time series historical data.

The IP team made extensive use of [Altair's Center of Excellence \(CoE\)](#) method to identify priority use cases and train users on best practices.

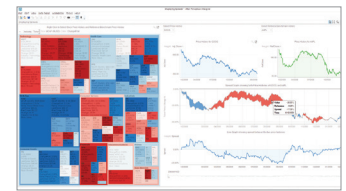
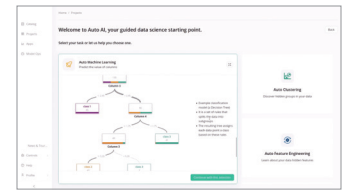
IP built and deployed numerous prescriptive models that provide guidance on equipment settings for machine operators and predictive models to optimize consumption of raw materials, improve paper quality, and enhance the effectiveness of wastewater treatment processes. The team integrated the Altair tools with the BrainCube IoT platform and the AVEVA PI System data management platform.

Results

The resulting system ingests and processes sensor data from the company's manufacturing machinery, including recovery boilers, and produces real-time scores on a range of key performance indicators (KPIs). Machine operators will be able to interact with easy-to-understand dashboards and can make changes to production parameters to see the impact on production outputs.

Machine learning models built and deployed using Altair AI Studio and Altair AI Hub process the sensor data provide real-time recommendations on production equipment settings which are displayed in the Panopticon dashboards.

As a result of implementing the system, IP is seeing substantial reductions in energy and material waste, increased operational efficiency, and improved consistency and quality of output.



TOP: Altair AI Studio's award-winning AutoML tools support automated clustering, predictive modeling, feature engineering, and time series forecasting. **BOTTOM:** Panopticon dashboards display IoT sensor data and the outputs of machine learning models in real time.



By continuously analyzing data related to raw materials, process parameters, and product characteristics, our process engineers can identify deviations from quality standards and take corrective actions in real-time. The Altair system helps us optimize energy consumption, minimize waste, and reduce the overall environmental impact of our operations."

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