SOLUTIONS FLYER

ADVANCE ASSET MAINTENANCE STRATEGIES WITH PREDICTIVE ANALYTICS

The costs of scheduled or unscheduled downtime in manufacturing environments can be significant. To minimize this risk, manufacturing operations have developed standard equipment maintenance calendars and manual asset monitoring processes. Unfortunately, this approach is expensive, resource-intensive, error-prone, and forces companies to remain reactive.

Altair® RapidMiner® provides an integrated, AI-driven approach to predictive maintenance, allowing manufacturers to move from reactive to proactive operations. It enables organizations to avoid machine failures and unplanned downtime, increase equipment and production line productivity, reduce maintenance costs (including hard component replacement costs and associated personnel time), and improve output quality.

First, Get the Data Right

The effectiveness of a predictive maintenance strategy depends on the data quality and accuracy of transformation, analysis, and generated insights. Manufacturing data may be generated by and stored in a variety of systems, very few of which will produce data in the same formats.

Altair RapidMiner's unified AI fabric simplifies the integration of data from diverse sources without coding or manual transformation.

In fast-paced manufacturing environments, real-time sensor data is typically transferred over message buses and protocols such as Message Queuing Telemetry Transport (MQTT) and requires special consideration due to the amount and velocity of data. Stream processing enables real-time transformations of this data, prior to storage in a time series database.

Once all the data is accessible, the analytics team must ensure that it is cleansed of errors, duplicates, and incomplete records. It must be structured consistently in order for machine learning and visualization tools to use the data effectively.

Detect Anomalies

Identifying unusual behaviors or patterns in machine components using sensor data can prevent small glitches from creating major operational problems. In cases where large numbers of sensor feeds are involved, challenges emerge due to the sheer volume and velocity of data streaming off the equipment.

> "Good data analytics tools do not require a degree in data science to use them effectively. A self-service approach fosters utilization of the technology, reduces the time-to-market for analytics-based business processes, and helps ensure that analytics projects are adding real business value."
>
> Sam Mahalingam, CTO, Altair

Altair's streaming analytics and anomaly detection tools enable real-time monitoring at scale, surfacing only the most critical alerts using statistical and machine learning (ML)-based techniques—reducing false positives while protecting overall equipment effectiveness (OEE).

Predict Machine Failures

Using Altair RapidMiner, teams can rapidly prototype and deploy ML models that flag machine and component-level failures before they occur—without requiring specialized programming. Failures may be binary in nature or multi-class (e.g., speed reduction, output variability). The more complex the equipment, the more ML can help uncover root causes of potential failure modes.

Predict Remaining Useful Life (RUL) for Components and Systems

ML and stream processing technology are the most effective solutions for RUL analysis. The large amounts of data produced by sensors combined with human inspections of finished pieces can be used to train machine learning algorithms to identify that "sweet spot" and proactively alert operators when a tool is approaching time for replacement.

Altair enables RUL modeling with integrated visual workflows and automated machine learning—making it easier to retrain models and deploy them into production pipelines for continuous insight.

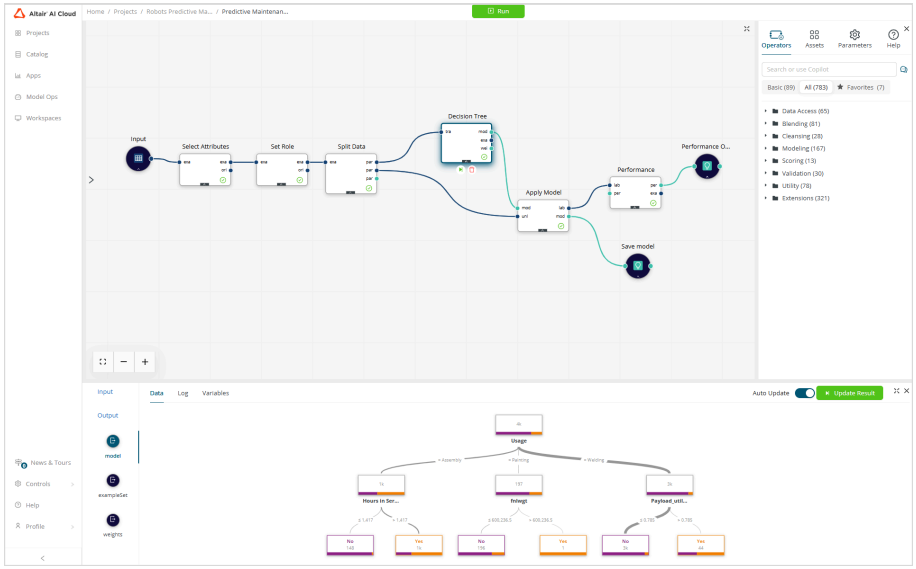
Predictive Maintenance with Altair RapidMiner

Altair RapidMiner is a complete platform for end-to-end predictive maintenance workflows, combining data preparation, machine learning, and real-time analytics within a unified environment. Designed to scale from desktop to enterprise infrastructure, it allows engineers, analysts, and business teams to collaborate on predictive maintenance solutions with ease.

Data Preparation: Seamlessly access, clean, and format operational and sensor data from any source—ERP, MES, IoT platforms, Excel, or PDFs—with no coding required. Integrated tools ensure data is analytics-ready from the start.

Machine Learning: Build models using a drag-and-drop interface or code, then operationalize them quickly with automated machine learning (AutoML) and explainable AI features.

Streaming Analytics: Monitor equipment in real time using no-code streaming applications that detect anomalies, surface trends, and trigger alerts the moment conditions deviate from optimal thresholds.



Using a drag and drop interface, data transformation and machine learning workflows can be configured in seconds and deployed on live data, without any need for coding.

Learn More at:
altair.com/manufacturing-analytics