

CONNECTED PRODUCTS DELIVER BIG ROI

AI IMPROVES CUSTOMER SERVICE AND PRODUCT QUALITY FOR WHITE GOODS MANUFACTURER

About the Customer

Mabe manufactures home appliances, including stoves, refrigerators, washing machines, dryers, water purifiers, and more. The company is based in Mexico City and markets its white goods under its own brand as well as several others, including GE Appliances, in more than 70 countries. Mabe is an early leader in the development of connected products that allow its customer service personnel to monitor the health of its appliances in the field. Altair has been at the center of Mabe's product development process for years, and Mabe is now working with Altair to deploy and enhance its connected products strategy.

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Altair's data visualization and machine learning tools help us predict possible failures in the field, understand how our customers are using our products, create more efficient development strategies, and improve customer satisfaction. The software's explainable AI capabilities enable us to understand all the factors that contribute to maintenance.

Martin Ortega
Design Leader, Mabe

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Their Challenge

The company recently launched a new high-end washing machine that generates more than 20 signals that measure water temperature, water levels, vibration, torque, noise, pressure, rotor position, and other parameters. This smart, connected product lets the Mabe product team analyze real-time streaming sensor data to understand in-service use-cases and predict potential failures. It also allows them to aggregate and analyze data collected from many in-service machines over long periods of time to inform next generation design improvements, material selections, and supplier options for subassemblies and components. However, Mabe needed a more efficient, automated approach to cope with the vast amount of data, including its velocity and complexity.

Our Solution

The combined Altair/Mabe implementation team divided the project into three stages: data pre-processing, machine learning, and data visualization.

Mabe set up a high-performance SQL database to collect sensor data. Altair® Knowledge Studio®, an intuitive, market-leading machine learning (ML) and predictive analytics solution, supports direct connections to a variety of data sources, and in this case, used an ODBC node to access the data. The team used Knowledge Studio's visual interface to select the optimal ML models and built several models to automate performance analysis and failure predictions, including incorporating Mabe's existing Local Interpretable Model-agnostic Explanations (LIME) algorithm built in Python. The team found Knowledge Studio advantageous in its ability to support both code-based algorithms and those built using the software's visual interface. Mabe personnel found the software's intuitive design allows non-experts to evaluate different algorithms and understand the importance of the variables involved by implementing ML algorithms. The team used a subset of historical sensor data and known failure records to train the algorithms.

Mabe engineers worked with Altair personnel to develop a complete data analytics workflow that gathers sensor data from units in the field, applies a series of ML algorithms to that data, generates alerts about possible failures when discovered, and visualizes the data for in-depth analysis.

Real-time data visualization is a key component of the finished system. The team connected Altair® Panopticon™, a comprehensive data visualization and streaming analytics platform, directly to the SQL database. Working with Mabe's customer service, product management, and engineering teams, the team built and published dashboards that provided clear insight to all stakeholders on how the appliances are performing in the field.

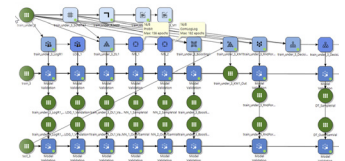
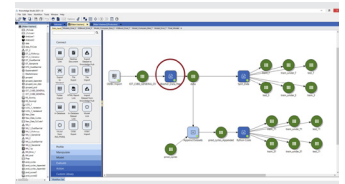
The entire workflow was built, tested, and deployed in less than 60 days.

Results

Collecting and analyzing sensor data streaming from customers' homes gives Mabe engineers a deep understanding of real-world use conditions. Using it, they can identify components and sub-assemblies that require design, supplier, or manufacturing process changes that support continuous product improvement. They're also able to gain valuable engineering insights by understanding how all the variables at play within an operating appliance interact with each other. They can advance their product development process and produce better designs for new models. The system also improves Mabe's customer service, shortens complaint response times, and reduces the number of warranty service calls required.

The Altair explainable AI solution addressed several challenges for the Mabe product line team and added even more value by being transferrable. Now, they have a complete workflow they can replicate with other product lines. It all adds up to more reliable products, reduced costs, improved competitiveness, and happier customers.

To learn more, please visit altair.com/data-analytics



TOP: Altair Knowledge Studio's graphical interface enables no-code development of AI algorithms. **MIDDLE:** Explainable AI means even complex models are easy to understand. **BOTTOM:** Altair Panopticon handles visualization of massive amounts of real-time and historical data.