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Sensor-Based Maintenance
Increasing Efficiency Through Predictive Maintenance

> " We were very happy to have Evora as an experienced implementation partner at our side. From concept design and technology consulting to implementation, rollout, and support in productive operation, Evora delivered everything from a single source. From initialization to implementation took a period of 18 months. Based on this work, PFW will benefit for years to come by applying the concept to new use cases. "
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> *Florian Bauer, Digital Application Consultant, Hutchinson PFW Aerospace*

PFW Aerospace

PFW Aerospace, a leading solution provider to the manufacturing aerospace industry, has converted the maintenance of its machinery to predictive, sensor-based maintenance using SAP technology.

Challenge

The task was to develop a system that closes the gap between PFW's machinery and the ERP system. With the use of sensor data, runtime-based maintenance was made possible in the first step since this allowed for the greatest economic benefit. At the same time, PFW wanted to be able to build more complex use cases like predictive maintenance within the same system in following phases.

Project Approach

Due to the changed economic situation caused by the COVID-19 pandemic, the focus has shifted from predictive maintenance for preventing machine failures to the transition of previously time-based to sensor-based maintenance. From project initialization through the pilot phase to the implementation phase, Evora advised and supported the PFW team. Evora succeeded in developing a concept for PFW that both meets short-term requirements and can be applied to future use cases.

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Solution

For the connection of the machine level with the SAP system, the OPC (Open Platform Communication) technology was implemented and either existing controls were retrofitted with OPC or an OPC interface was activated. All plant assets can transmit their sensor data bundled to the SAP cloud solution via an internal server. Products from the Intelligent Asset Management portfolio were used: SAP IoT, SAP Asset Central and SAP Predictive Asset Insights. The cloud solution based on the SAP Business Technology Platform fulfills two functions: first, it synchronizes data to the ERP system where maintenance plans are scheduled and executed; second, it allows sensor data to be analyzed, viewed in time series and thus used in machine learning models.

Sustainable Solution & Reduced Maintenance Spendings

There are advantages for both profitability and sustainability. Often, plants are maintained by service companies or manufacturers. Their service technicians travel from distant locations with the service vehicles. On-demand maintenance service saves trips and thus prevents CO_2 emissions. PFW has implemented performance-based maintenance for 40 machines, which required approximately 100 service calls per year. It is anticipated that 25 service calls will be saved annually, avoiding up to 6,000 miles driven per year. Also, there are additional savings for unused materials. Already in the first year, approximately 10% less external maintenance was required and simultaneously 600 machine hours were made available.

Rapid Failures Detection

Furthermore, PFW is working on an alarm system that detects critical machine conditions and quickly forwards them to the specialists. For example, the charging carriage of a heat treatment furnace is monitored so that error conditions are sent to the cloud. An alarm is created there, which immediately informs a distribution circuit by mail. This enables maintenance to respond quickly, allowing them to evacuate the batch from the furnace quickly and save the components from quality rejects. This also saves valuable resources such as titanium, aluminum and gas-generated heat.

Reduce Energy Consumption

PFW also equipped buildings with sensor technology and launched initial pilot projects in energy consumption. The aim is to use sensor data to identify anomalies in energy consumption and take appropriate measures. By comparing historical with future consumption data, the efficiency of actions taken can be proven.

Detailed project presentation is available as recording of joint webinar:
https://evorait.com/l/pfw

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