



## Challenges

- Missing production forecasts due to unplanned downtime caused by disruptions in production.
- Meeting service-level agreements while achieving cost-reduction targets.
- Too frequent and unnecessary preventive maintenance that interferes with production schedules, strains maintenance staff and increases costs.
- Increasingly demanding regulatory compliance mandates that come with penalties and liabilities and can be damaging to your brand.

# SAS® Asset Performance Analytics

Maximize asset utilization for reduced costs and increased productivity

## Overview

Your high-capital assets are important. Their performance can make or break your operation. Unplanned outages due to equipment failure can mean missed commitments and millions in lost opportunity. Even degradations in equipment performance steal profits and inflict unnecessary costs.

Today, challenges abound as organizations strive to meet aggressive production schedules while lowering maintenance and operating costs and guaranteeing safety and equipment reliability.

Many maintenance strategies rely on manufacturer recommendations, inspection and repair procedures and schedule-based (just-in-case) replacements. This approach leads to over-consumption of spare parts, more frequent and longer planned-maintenance downtime and even an increased chance of failure.

For your essential assets, an analytics approach can detect equipment degradation and predict impending failures, which means more efficient maintenance, lower costs and higher yield.

## The SAS® Solution

High-capital equipment, by definition, requires a large investment to acquire, install and operate. It's also critical to the success of your organization, and its yield is directly tied to revenue.

Unplanned downtime and unexpected failures mean lost revenues that are difficult to recover. And worse, catastrophic failures can lead to environmental, health and safety issues. SAS Asset Performance Analytics helps maximize the use and effectiveness of your vital assets. We provide:

- An analytics-based framework to improve uptime and utilization while reducing the amount of unscheduled maintenance to contain costs and minimize disruptions.
- A web-based, point-and-click interface for reporting to support a broad spectrum of users, from business managers to statisticians.
- Rich, interactive analysis and discovery tools to identify the root-cause events.
- Data mining capabilities that generate predictive alerts to solve problems (before they occur) in a planned manner during a scheduled outage.

SAS Asset Performance Analytics monitors equipment sensors, tags and machine-to-machine (M2M) data to identify hidden patterns that predict failures. This gives your personnel time to schedule taking equipment offline for maintenance, avoiding unplanned downtime, revenue losses, and environmental, health and safety issues.

SAS Asset Performance Analytics means even lower costs and simplified IT. SAS has always been able to easily access your data from virtually anywhere. Now, resource-consuming data movement is reduced through in-database and in-memory analytics procedures and model development. For Hadoop or SAP HANA, SAS gives you predictive analytics for real-time decision making. As the data flows in, you can act fast - with greater insight.

## Benefits

### Maximize quality

SAS Asset Performance Analytics uses the SAS Quality Analytic Suite to provide an enterprise view of your quality performance data, identify potential issues early and quickly find root causes to maximize production yield, manage the cost of quality and increase customer satisfaction.

### Reduce unplanned downtime

Predictive models monitor the system in near-real time to identify patterns that indicate a performance issue or likely failure, before it occurs. Data visualization and BI capabilities provide detailed information regarding the nature and severity of the issue, allowing you to proactively address issues before they cause downtime or performance degradations.

### Optimize planned maintenance cycles

Automatic alerts, in addition to data visualization and BI tools, enable you to plan and prioritize fixes during regularly scheduled maintenance windows. This helps you make optimal use of maintenance resources, lower operational costs, and increase equipment availability and profits.

### Effectively identify and resolve root causes

Advanced analytics, data mining and data visualization allow engineers to identify the real drivers of performance issues out of hundreds or even thousands of measures and conditions. In addition, corrective and preventive action (CAPA) and case-management workflows support speedy and repeatable problem resolution, highlight the best corrective action, and improve reliability, equipment efficiency and quality.

### Get answers faster

SAS embedded processes run in database. You can use your existing memory to handle model development and deployment. There is no need to make copies and move to a separate server for processing.

### Lower total cost of ownership

Bringing the analytics to the data creates a single IT environment. SAS on HANA or Hadoop also reduces maintenance and total cost of ownership for IT.

## Capabilities

### Highly scalable data integration and management

Now with direct support for storing your data in SAP HANA or Hadoop, SAS data integration is even more flexible to meet your needs. Our data model overcomes barriers imposed by siloed operational systems, enables true visibility into what is happening on the shop floor (and out in the field), and enables comparisons between entities - facilities, production lines, fleets, etc.

### Automatic monitoring and alerts

Automated monitoring and alerts allows you to focus on issues that require speedy resolution. Alert notifications can be sent via email, text or pager, as part of a workflow or integrated into your information portal.

Alerts guide engineers directly to the supporting control charts and can supply other reports you may need for analysis. They can easily drill down into the charts to better understand the cause of the issue.

CAPA workflows are initiated, and case management provides a knowledge repository for standardized problem resolution, enabling audit capabilities for asset and process changes.

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## Predictive modeling

Advanced predictive modeling accurately and reliably finds hidden patterns in the data that indicate an impending failure or performance degradation. New models are developed based on historical events.

In the dawn of the Internet of Things era, high-performance analytics ensures virtually limitless scalability to continuously monitor the health of your assets. It tests new sensor data against defined rules, thresholds and predictive scoring models to give you ample insights and time to take the appropriate corrective action.

## Advanced analytics

Advanced analytics means faster root-cause identification, better first-time fix rates and fewer repeat failures. Whether they're casual users or senior statisticians, users can easily drill into data and reports to explore the conditions, correlations and causality of events (and the likelihood of future events). Using CAPA workflows, the root cause is quickly identified, and preventive action can be taken to keep the operation running smoothly.

## Self-service data visualization and KPI dashboards

Robust reporting capabilities allow you to access standard and customized reports and KPI dashboards with drillable views, snapshots and trends. You can easily create ad hoc reports with interactive data selection and parameter definitions. All reports and graphs can be easily shared with anyone in the organization. An executive dashboard can provide reporting on current performance at various levels and dimensions (e.g., by geography, organizational units, functional areas or asset types).

## Asset replacement decision support

The system supports your repair-or-replace decision analysis. Downtimes, production losses, parts costs, labor costs, event probabilities, etc., are all considered to find the most profitable solution.

## The SAS® Difference

Only SAS delivers the entire range of capabilities you need – from data integration and analytics to optimization and reporting – to create a true picture of what has happened and transform it with analytic and predictive capabilities into what will happen. SAS provides:

- Highly scalable data management. Combine sensor data with other critical information for monitoring, model development, root-cause analysis and reporting.
- Predictive modeling. Accurately predict failures of assets and equipment before they occur.
- Integrated advanced analytics. Obtain powerful, integrated, causal analysis of asset failures and performance issues.
- Model management. Automatically track the accuracy of predictive models over time by tracking and documenting all actions, from model development through model retirement.
- Enterprise business intelligence. Access the latest maintenance and operations performance indicators through a web-based, point-and-click interface.



