

# SAS® Quality Analytic Suite

Driving new levels of quality performance



“You have to build from a strategic planning perspective. SAS has done exactly that: They have created a unified platform for manufacturers to gain a holistic view of quality.”

**Bob Parker,**  
Vice President of Research,  
IDC Manufacturing Insights

## Staying Ahead of Rising Quality Expectations

Customer expectations of quality are higher than ever, putting greater pressure on manufacturers to continuously improve. Traditional approaches to quality improvement have focused on optimizing specific processes based on limited data inputs. But that's no longer sufficient. To stay ahead of customer expectations and competitors, it's vital that manufacturers have a holistic, customer-driven view of quality. This approach helps you understand the complex relationships between the voice of the customer, the voice of the product (i.e., information being communicated by connected devices) and the voice of the process (i.e., information being gathered from production equipment and related areas).

For example, imagine that you have a spike in warranty claims tied to a batch of products built in a short time frame with a specific piece of equipment. Further investigation uncovers a combination of environmental factors that caused that piece of equipment to produce defective products. By tying data sources together from the field and the entire

manufacturing process, you can determine root causes and deploy analytic models to prevent future defective products from being built. This holistic approach also enables earlier warning of quality issues, accelerates problem solving and allows you to take proactive steps to avoid issues before they occur. And ultimately, it drives lower costs, improved brand image and stronger sales.

The good news is that technology innovations such as social media, the connected factory and the Internet of Things (IoT) are exponentially increasing the amount of detailed quality data available. The bad news is that this data often exists in silos across the organization, making it difficult to generate valuable, quality-related insights.

What's needed is a way to aggregate data from any source in near-real time and turn it into practical insights. SAS can help with the SAS Quality Analytic Suite, an integrated, IoT-ready solution suite that turns data into insight, regardless of whether it comes from external sites, internal systems or even real-time monitoring.

## Driving Quality Performance

The SAS Quality Analytic Suite brings together four powerful quality improvement solutions:

- **SAS Perceptual Quality** - Understand customer perceptions from social media, review sites, forums and other unstructured sources.
- **SAS Field Quality Analytics** - Detect emerging issues and root cause within warranty, call center and other field data sources.
- **SAS Asset Performance Analytics** - Boost uptime, performance and productivity by harnessing machine-to-machine and sensor data.
- **SAS Production Quality Analytics** - Improve quality and production performance by integrating data from across the manufacturing process and supply chain.

By delivering all of these solutions on a single platform, SAS supports an industry-leading, enterprise approach to improving quality outcomes. Now you can:

- Have an enterprise view of your organization's quality performance.
- Identify potential issues earlier.
- Find the root cause of quality issues quickly and address it proactively.

## Delivered on an IoT-Ready Solution Suite

As shown in Figure 1, the SAS Quality Analytic Suite runs on an IoT-ready foundation that can centrally access and analyze everything from "dirty" sensor data to extensive operational and customer information in a modular fashion. Data can be consumed as it is generated and instantly analyzed as it becomes available.

In addition, the SAS Quality Analytic Suite comes ready to monitor incoming data in real time, as it is generated, so you can apply models where and when needed.

## Delivering Value Across the Enterprise

As shown in Figure 1, SAS offers integrated solutions that help you address the key aspects of quality performance. Together, they help you:

### Enhance the Customer Experience

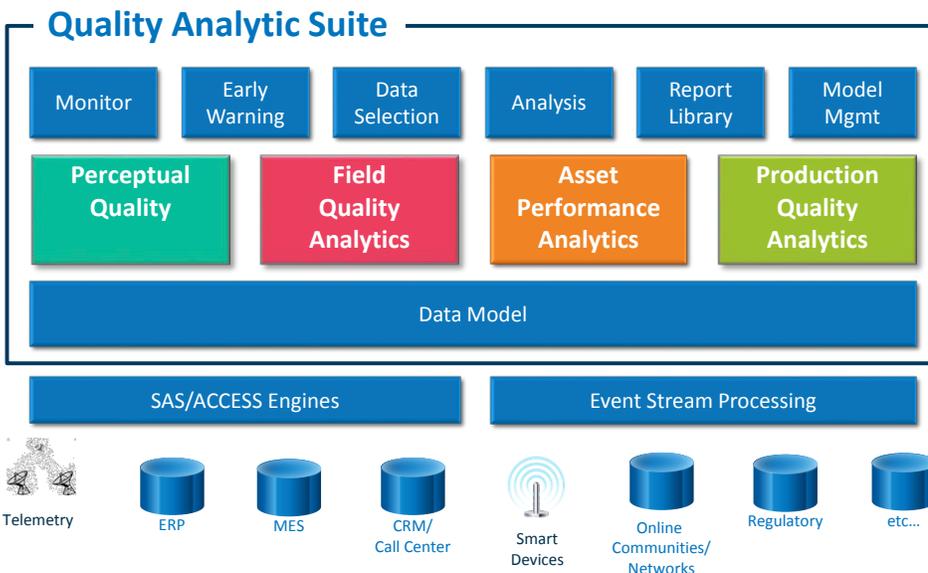
Quality is at the heart of the customer experience, which encompasses the entire customer life cycle - from awareness and purchase to ownership and disposal. Companies that get quality right - as defined by their customers - can harness the

customer experience to compete more effectively and even demand a premium for products. On the other hand, subpar quality can be devastating, thanks to the broadcasting capabilities of social media and product rating websites.

With the SAS Quality Analytic Suite, you can understand how your customers are defining quality and stay in touch with their expectations, which typically go well beyond the quality department's definition of KPIs and conformance to specifications. What materials were used? Is it sustainable? Does it feel robust and reliable? Does it function the way - or as well - as I thought it would? Did I get the value out of it that I expected? These are just a small sample of the questions a consumer might use to evaluate a product. With SAS, you can evaluate customer sentiment for not only your own products, but also your competitors', by evaluating publicly available data from the plethora of rating websites and social media, as well as by detecting patterns in your own data such as call center records and service call notes.

### Reduce Warranty and Recall Costs

Warranty costs are a necessary, if not strategic, part of doing business for manufacturers. With the SAS Quality Analytic Suite, you can keep warranty costs as low as possible by finding and resolving issues quickly. Patented early warning algorithms detect potential issues months earlier, allowing you to start the problem-solving process earlier. The included analytics help you isolate the population that is likely to fail, enabling smaller, more focused recalls. Faster detection, earlier resolution and more targeted recalls help minimize the direct financial cost of repair and replacement, as well as protecting brand equity by minimizing the impacts of product issues on customers and their experience.



# Challenges

## Improve Enterprise Quality and Production Performance

The SAS Quality Analytic Suite integrates the relevant data from disparate and isolated systems to provide a holistic view of your product and process quality picture. Next, it applies advanced analytics, enabling you to identify emerging issues, prioritize them and resolve them quickly. As a result, you can trust the quality of your products and manufacturing processes, be confident in production yields and schedules and achieve customer orders on time. Equally important, you can launch products faster and lower operational and warranty costs - all while sustaining high customer satisfaction and profitability.

## Predict Maintenance Needs and Lower Maintenance Costs

Unplanned downtime wreaks havoc on production efficiency. Not only are products not shipping, but workers sit idle. And once a machine develops a history of failure, production managers tend to stockpile "safety stock" at great cost. But with the SAS Quality Analytic Suite, you can automatically monitor system performance and predict the likelihood of failure with enough window to enable orderly and planned maintenance and help avoid costly line stoppage. As a result, you can schedule production with confidence - with less unplanned downtime - and help eliminate unnecessary and costly maintenance.

## Identify Root Causes Faster

Thorough, accurate and reliable root cause analysis is crucial to solving quality and reliability issues. With SAS software's advanced analytics and predictive modeling, you can perform root cause analysis quickly and efficiently. This saves critical time, resources and money. The SAS Quality Analytics platform includes a complete spectrum of analytical tools, such as:

- Explorative analysis.
- Design of experiments and optimization.
- Cause-and-effect analytical tools.
- Neural networking, regression analysis and clustering.
- Predictive modeling.

### Poor quality performance

Poor quality performance is often due to disparate quality systems and data; ineffective measurement of quality metrics; ad hoc audit; compliance and risk management; poor visibility into supplier quality; and broken feedback loops with engineering and production records.

### Measuring return on investment for quality

It's hard to find the right balance between quality investments - for example, in higher-skilled labor and engineers, specialty software, advanced machinery and better raw materials - and quality outcomes. Every investment should ultimately help improve profitability.

### Siloed operational risk management

When manufacturers rely on siloed processes and data between marketing, customer service, quality and engineering, proper measurement of quality metrics simply can't happen. Everyone operates in isolation regarding process, product and supplier quality, without a formal, enterprisewide process for managing risk.

### High warranty and recall costs

Warranty and recall costs are part of every manufacturer's business, but to keep them from consuming profits, companies need to identify emerging issues sooner, understand their total cost and business impact, and tackle priority issues faster.

### Traceability

Many stakeholders require quick traceability in the event of a quality issue, safety concern or other issue. Whether responding to a government regulatory body or a key customer, you need to be able to pull data from disparate systems to quickly respond as needed.

### Maximizing equipment uptime

Capital-intensive industries rely on their vital assets. Equipment failures mean missed production schedules and lost revenue. And planned downtime often consists of just-in-case maintenance and part replacements. You need a way to achieve optimized, sustainable maintenance strategies and run assets at peak performance.

## SAS® Differentiators

### A Common Framework for the Quality Life Cycle

While other approaches on the market focus on controlling and managing quality using a mix of disjointed point solutions, SAS delivers a common framework through the SAS Quality Analytic Suite. It enables a

consistent approach to using analytics to improve quality outcomes, as well as a common data model, workspaces and user interface. In addition, the solution is modular, allowing you to start by solving issues in one quality area and then add functionality as your analytics culture matures.

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Using our custom analysis framework and interactive graphical interface, both the casual business user and the high-end statistician can use the SAS Quality Analytic Suite with ease.

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“The application of analytics has ultimately led us to a more holistic understanding of the concept of quality. Quality isn’t just a PC working correctly. It’s people knowing how to use it, getting quick and accurate help from the company, getting the non-Lenovo components to work well with the hardware and understanding what the customers like about the existing product – rather than just redesigning it because product designers think it’s the right thing to do.”

Mohammed Chaara, Director of Customer Insight and VOC Analytics, Lenovo

### Enterprise-Quality Data Management

With the SAS Quality Analytic Suite, it’s never been easier to integrate structured and unstructured quality-related data from sources across your business. Use it to transform, standardize and cleanse any kind of data to prepare it for analysis. And harness logical and physical storage capabilities to capture all aspects of the manufacturing process – from suppliers through manufacturing and field performance. The result is an enterprise view of quality performance that helps you drive better quality outcomes.

### Automated Early Warning Analytics

With the SAS Quality Analytic Suite, you can identify quality-related issues early and take proactive, corrective action. Patented algorithms detect issues months earlier.

Advanced analytics help you sift through massive volumes of seemingly unrelated data to identify unknown patterns. Predictive analytics empower you to automatically assess the likelihood of failure or issue. And using customizable models that adapt to any situation, you can modify the solution to address those variables that are most important to your products and production processes.

### Advanced Ad Hoc Analytics

To meet the unique needs of data scientists, the SAS Quality Analytic Suite provides access to the underlying SAS platform, which provides extensive, high-powered analytics. These power users can still take advantage of the full suite’s data integration and data quality capabilities, as well as develop custom analyses for their own use or to share across their organization.

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SAS’ enterprise quality-centric data model captures large volumes of data across the entire product life cycle and prepares it for analysis, regardless of format or source.

### Real-Time Analytics

Through integration with SAS Event Stream Processing, the SAS Quality Analytic Suite allows users to push analytic models from the Analysis Workspace to monitor streaming data. When alerts are generated, users are notified and can view results in the Early Warning Workspace, where they can conduct further analysis.

### Components

The SAS Quality Analytic Suite includes:

#### SAS® Perceptual Quality

Analyze unstructured data from internal and external sources (social media, review sites, contact center, etc.) to detect emerging quality issues, understand market reactions to product launches, and gather competitive intelligence.

#### SAS® Field Quality Analytics

Integrate warranty, call center and other field data with key customer, product, manufacturing and geographic information so you can receive early warnings; make informed, timely decisions; and reduce warranty costs.

#### SAS® Production Quality Analytics

Gain a holistic view of your manufacturing processes to proactively address potential quality and performance issues.

#### SAS® Asset Performance Analytics

Improve uptime of crucial assets and reduce unscheduled maintenance, which increases productivity and reduces operational costs.

To contact your local SAS office, please visit: [sas.com/offices](https://sas.com/offices)

