

# Quality Optimization

Sustainable, insight-driven quality analytics for manufacturers



## No standing still on quality

When high-performing athletes get pushed to their limits, they're encouraged to take a break in order to recover, recoup, and prepare for the next contest. But when manufacturers are pushed to their limits, there's no break in the action – they're just expected to race to the next milestone, improving quality, speed and performance along the way.

That's the dilemma manufacturers are facing today. Pushed to their limits during the pandemic, manufacturers are facing ever-higher quality expectations in its ongoing aftermath – even as the cost and effort to do so are steadily rising. Many have already recognized the inevitable: Relying on the same tools, approach, and resources won't be enough to ensure high levels of quality at today's pace. And with a wave of retirements among seasoned manufacturing professionals, hands-on experience and gut instincts are already providing diminishing returns.

Deeper insights based on manufacturing data are the starting point for sustained, significant quality improvements in manufacturing today. The Grain's Quality Optimization services, powered by SAS® Analytics for IoT, are already showing how to put them to work.

## Merging macro and micro requirements for quality

Quality-obsessed manufacturers know that there are two equally important, tightly connected aspects of this issue – macro and micro. The micro view of quality plays out on a day-to-day, output-by-output basis: Do the products we're manufacturing today meet our standards for quality? This is typically monitored through end-of-line quality inspections executed by human operators and mechanized, automated approaches in areas such as visual detection.

The macro view of manufacturing quality takes a broader process- and organization-oriented perspective. What changes should the manufacturer make to its processes and organizations to achieve a consistently high level of quality over the long run? The answers to this bigger-picture question can often be found buried deep in routine quality data being generated virtually every moment goods are being manufactured.

For many manufacturers, the challenge lies in making actionable connections between the macro and micro views of quality. Small, day-to-day improvements may not scale well, and process-level changes may hog resources and risk disruption without having the desired impact.

The Grain's approach to quality sensing and detection brings together advanced visual detection capabilities and workflow/process-level smart quality capabilities to create a single, end-to-end, data-driven approach that has a proven impact on quality. Here's how it works.

## Computer Vision

Before manufacturers can improve quality, they must measure it. Most of the time, this is still done by an operator conducting a manual inspection of the manufactured goods on a sample basis. Remarkable advances in computer vision make it possible to automate much of this process, with superior results. Using digital images from cameras, videos and deep learning models, machines can accurately identify defects and assign a quality score to all manufactured goods.

Accuracy rates for object identification and classification have increased from 50% accuracy to 99% accuracy in under a decade – today's systems are more accurate than humans at quickly detecting and reacting to visual inputs. And it can be done continuously in real time. These computer vision capabilities are used in our Quality Optimization services.

Production Process Optimization is designed to drive action on quality issues – not just to identify and measure them.

Using Quality Optimization, users can build a digital twin of their production process. From there, they can connect quality sensing signals (output from computer vision) with other production data and process parameters that can potentially impact their quality signals.

An automated root-cause analysis uses all data to identify the main drivers for quality losses and provide insights and recommendations for optimal process settings, which are ultimately reviewed by a quality manager. Based on those insights, the quality manager can define alert rules and set clear instructions on what actions to take when a potential quality issue arises.

Operators on the production floor receive a notification whenever an alert occurs and will be able to quickly take corrective actions based on instructions set by the quality department.

## Benefits

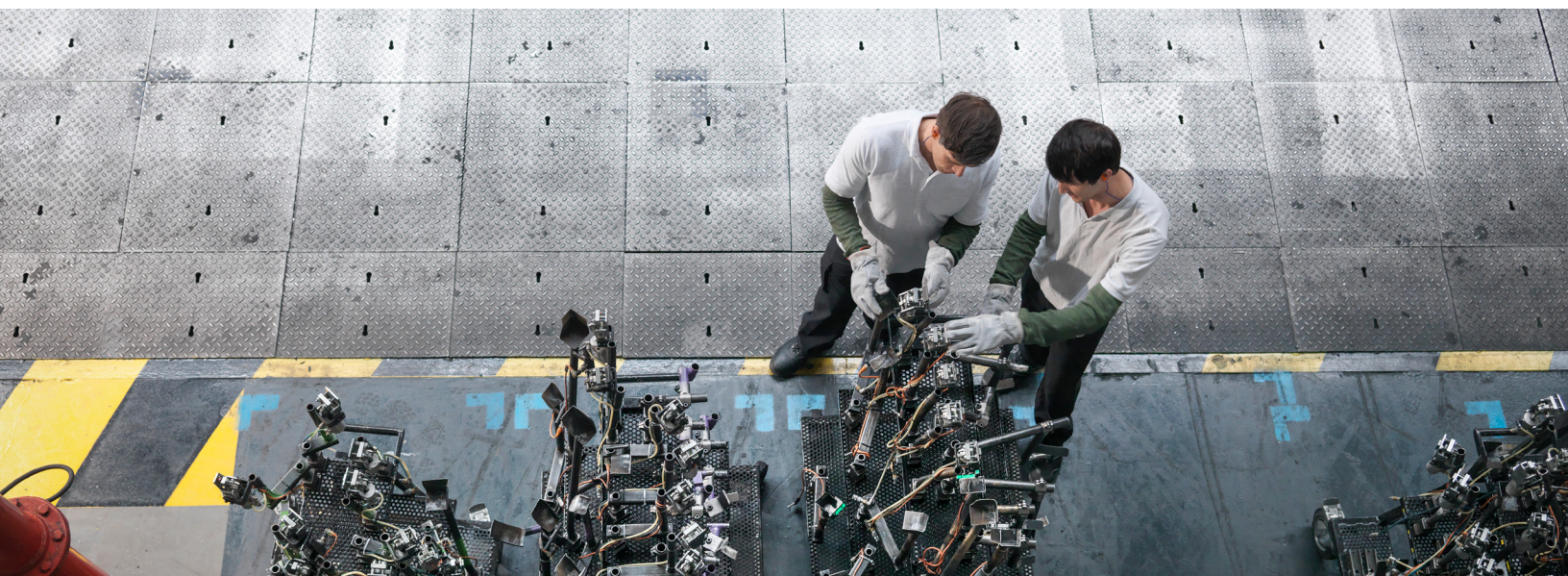
**Understand changes quickly:** Deliver up-to-the-minute insights into the performance and quality of manufacturing operations, enabling tighter process control at every level.

**Lower the cost of quality:** SAS analytics combined with The Grain's predictive data mining capabilities drive continuous quality improvements, increased reliability and higher yields. With tighter controls and more efficient processes, rework and scrap rates will decrease.

**Increase profitability:** With optimal process setup from predictive modeling, manufacturers can improve asset utilization, optimize material consumption, and reduce rework rates and scrap expenses. This solution drives improvement in equipment performance and cycle times, increasing overall profitability.

**Make the right decisions at the right time:** With a data model specifically designed to handle "dirty" and missing sensor data throughout the enterprise, manufacturers can quickly identify patterns and deploy models while a process is still ongoing, allowing stakeholders to act promptly.

**Gain a holistic view of the enterprise:** The SAS enterprise data model captures large volumes of data regardless of format or source, then transforms, standardizes and cleanses the data to prepare it for analysis. Users can also extend it to incorporate any additional data types that are needed. In addition, advanced analytics and reporting let manufacturers align strategies to reduce the gap between target and actual performance.







## Let's talk!

When SAS' world-leading analytics capabilities are deployed by The Grain, a widely recognized global leader in Quality Optimization, facilities can achieve exceptional results. For a closer look at how these capabilities work together to drive stronger business outcomes for manufacturers, start by contacting:

[Bobby.Shkolnikov@sas.com](mailto:Bobby.Shkolnikov@sas.com).



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## THE GRAIN

The Grain is a data science IoT Channel Partner focused on building AI applications for industrial use cases. They enable companies to have a lasting impact by making analytics usable, scalable, and visible within operations. The team unlocks human potential by embracing technology and supporting the client's workforce in doing their day-to-day tasks better, faster, and smarter.



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