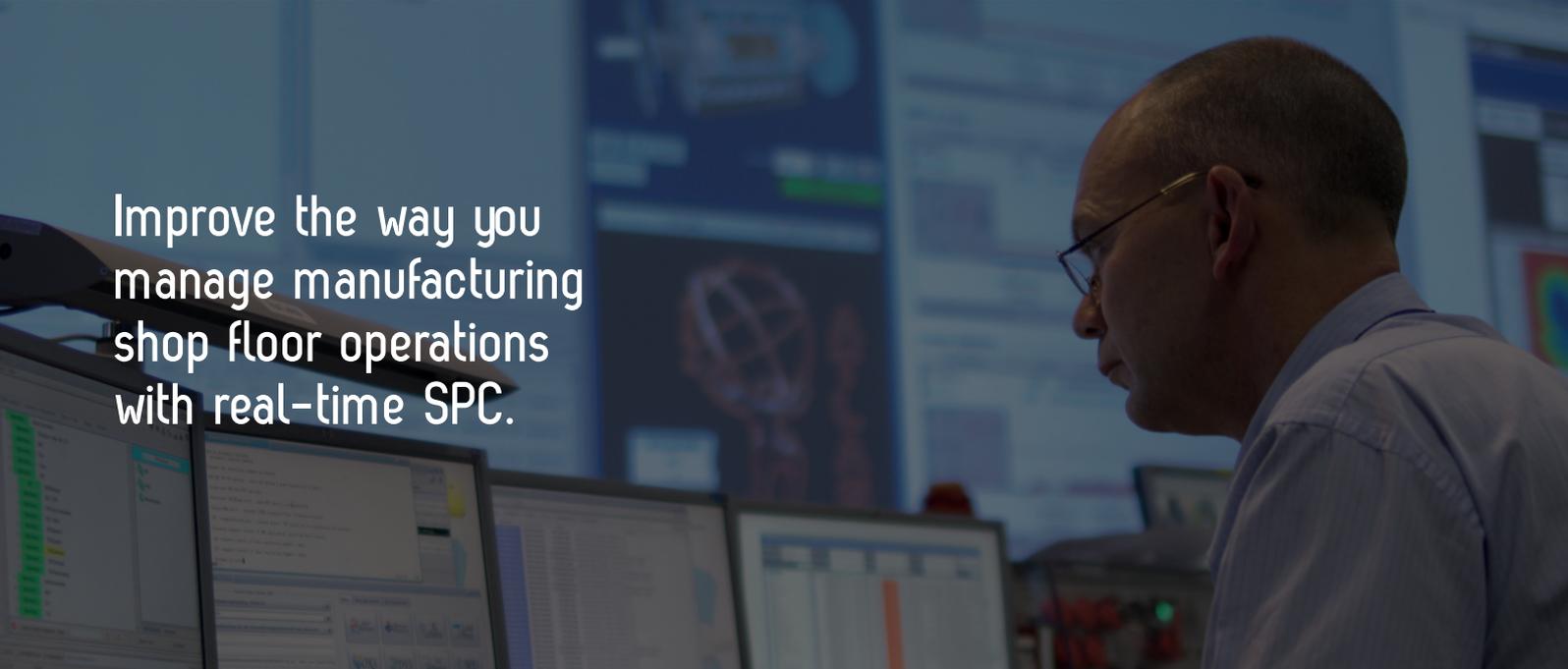


5 Ways to Bring Your Process Data Up to Speed

Improve the way you manage manufacturing shop floor operations with real-time SPC.

A man in a light blue shirt and glasses is shown in profile, looking at several computer monitors. The monitors display various data visualizations, including charts and graphs, typical of a manufacturing control room. The background is slightly blurred, showing more monitors and equipment. The overall lighting is dim, with a blueish tint.

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The success of any process-improvement effort depends on the accuracy and availability of your real-time statistical process control (SPC) data. But with modern manufacturing lines producing a multitude of products and potentially pumping out thousands of data points in any given minute, even real-time data can fall short. As a result, operations, quality, and Six Sigma teams find themselves drowning in data, missing collection points, or wasting time searching for the details they need to pinpoint process problems. If you want to get more from your manufacturing data, follow these 5 tips to get your SPC efforts up to speed, so you can outpace the competition.

Goal: Better Information for Faster Responses on the Shop Floor

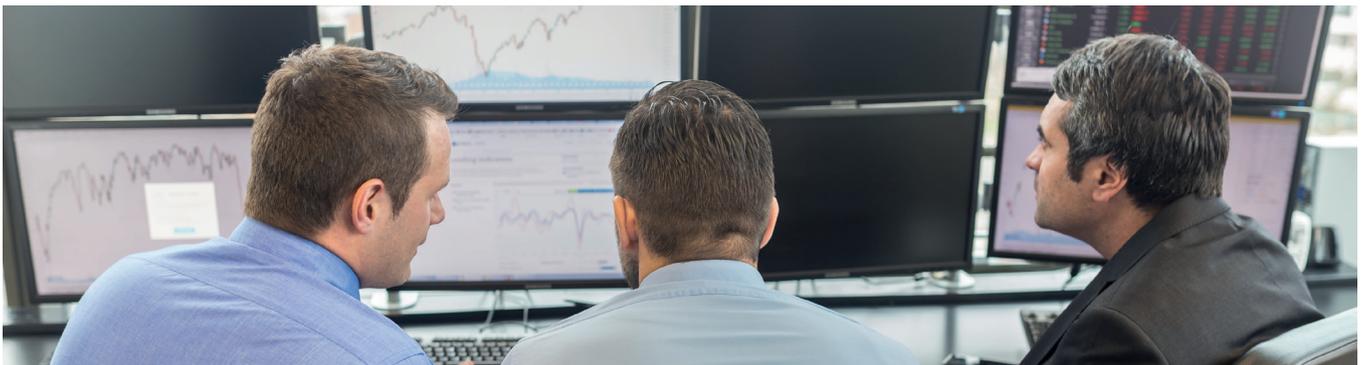
Manufacturers turn to statistical process control (SPC) to get a better grip on process data, using it to reveal opportunities for reducing product defects, waste, scrap, and recalls. The success of such efforts traditionally depends on the availability and quality of real-time quality data. With solid data, operators can catch defective product or inefficient processes as quickly as possible, and quality engineers can pinpoint and correct the causes of disruptive quality variances.

But in today's manufacturing environments, simply collecting and displaying real-time data isn't enough. Users can be overwhelmed as they try to keep up with the sheer amount of information pouring in from multiple products across multiple lines, shifts, or even sites.

Manufacturers must find SPC solutions that employ effective real-time data collection strategies at appropriate points along the process flow, so that they can keep tabs on the most vital and vulnerable process steps. These solutions must provide the ability to compare process output against specifications and control limits, so that operators can quickly identify nonconforming product, suspect machines, improper settings, and inefficient operations as quickly and accurately as possible.

So how do you monitor what's happening on the floor while it's happening, without becoming so buried in data that agile analysis and response become impossible? The following five tips can help you stay on top of process and quality data—without losing the flexibility to dig into important details when necessary, and without slowing down production.

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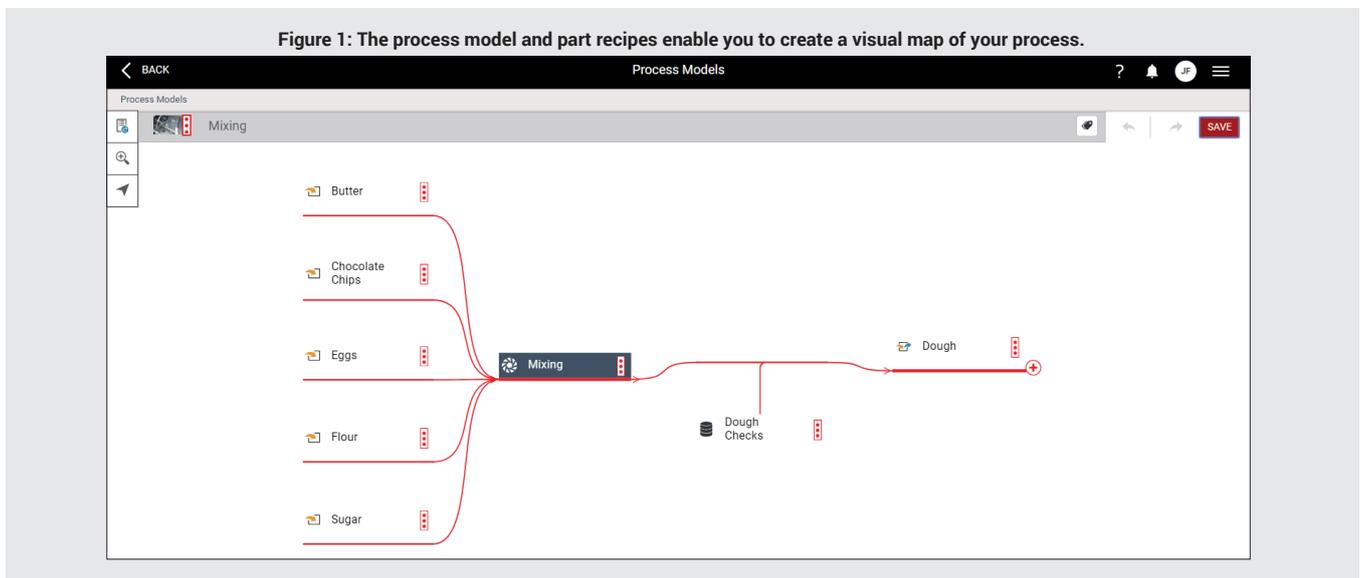


#1: Don't Wait to Check in on Quality

If you're waiting to collect quality data until finished products come off the line, your "real-time" data are likely coming too late to do much good in the event of a machine or process error. Yes, you'll spot the problem—after product may be ruined and money and resource time are wasted.

A better approach is to collect data at multiple points along the manufacturing process. The best places to measure are right after inputs are transformed into an output. This way, you catch trouble when and where it starts. Ideally, you'll be able to fix malfunctioning equipment or misconfigured settings before they do much damage. Plus, you'll have more meaningful data for your quality team to use in Six Sigma projects or other analyses.

A great way to implement this type of continual data flow is with an SPC solution that uses process models and part recipes. For example, InfinityQS[®] Enact[®] enables you to configure a graphical representation of how products are made (i.e., how inputs are transformed into outputs), which "recipes" are used to produce a specific product, and where quality checks happen during the process, as you can see in Figure 1.



In Enact, the process model is where you set up the map of your process and define elements of that process, including the details that will help operators check product quality in real time:

- › Upload pictures for easier identification during data collection.
- › Specify part families, quantities, and other details.
- › Configure code groups and special limits to use when identifying potential quality problems.

Figure 2: Part recipes and process models are configured through an intuitive interface.

Part recipes and process models document all the steps in the production process along with an array of other valuable information:

- › Process name
- › Data tags
- › Data collection flows and timing
- › Specification limits

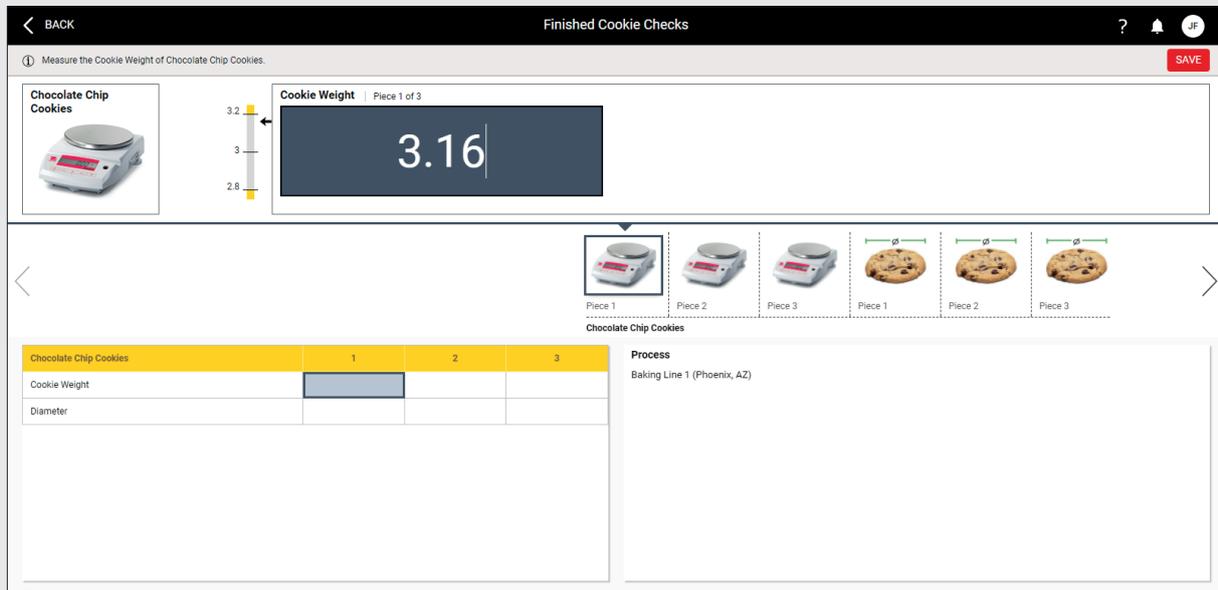
By checking quality earlier and more frequently, you can use your real-time data to implement real-time solutions.

#2 Make Data Collections (Practically) Impossible to Miss

A major “must” for any SPC implementation is the regular, accurate collection of data. Is your company still taking readings manually and jotting them down on paper forms? Or are operators expected to keep an eye on the clock so that they know when to make the rounds, testing and recording quality metrics? If you answered “yes” to either question, you could be in trouble. On a hectic production floor, it’s all too easy to transpose numbers or lose track of time. Such mistakes can put the brakes on the effectiveness of any quality- or process-improvement effort.

One way to reduce the likelihood of such stumbles is through an SPC solution that makes data collection faster, easier, and more accurate. Enact provides automated notifications to help keep collections on track, enforce best practices, and catch entry errors when they occur. (For example, you can set upper and lower allowable data input values.)

Figure 3: Automated notifications and collection parameters help to reduce errors or missing information.



Another way to help ensure the most accurate data possible is to use Enact’s optional add-on Data Management System (DMS) software. DMS can automatically collect measurement values from a variety of data sources—including gauges and digital devices, flat files, XML files, databases, and OPC servers (for PLC data)—and store them directly in Enact. DMS is a great tool for manufacturers who want to combine a robust SPC solution like Enact with existing data sources and automation. You can use such an approach to save time and to extend the value of existing data.

#3 Do Away with Data Overload

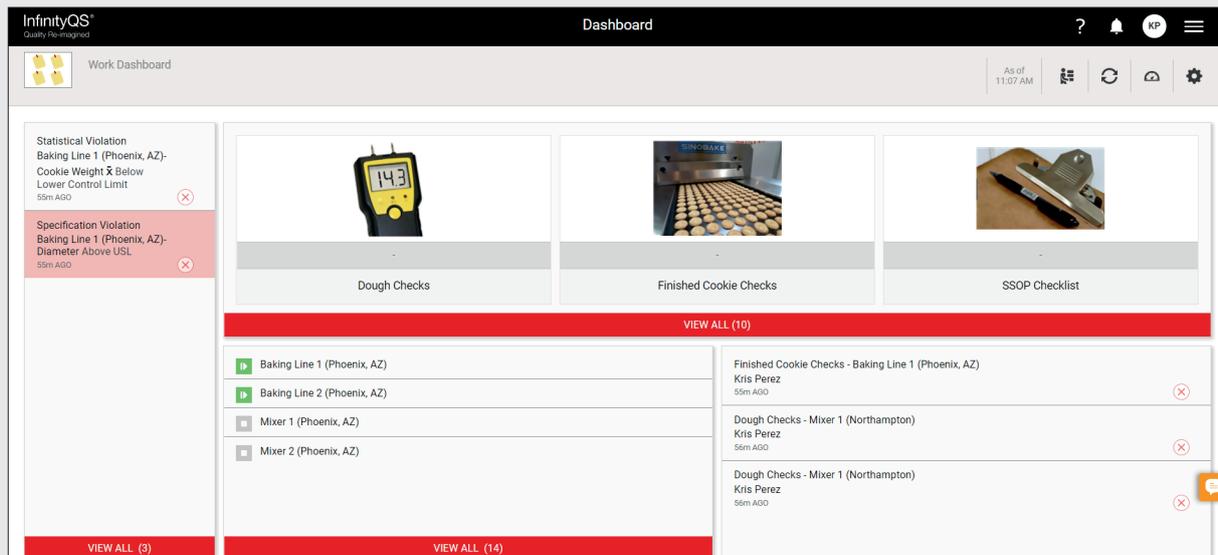
So now you are ready to collect data from across each of your lines and processes, and to keep them flowing consistently and accurately. But in the world of “Industry 4.0”—in which more equipment, materials, and products are becoming digitally enabled, deepening the data stream—how do you avoid information overload? When a manufacturing line produces thousands of data streams, how do you tap into the ones that can lead to the greatest improvements in production and profit?

The experts at InfinityQS pondered this challenge when designing Enact. An operator might be approved to work on multiple lines and switch between them depending on the day or shift. A quality manager naturally focuses on different information than a floor operator. A system or process that is out of spec takes priority at any given time. So manufacturers need a way to filter the data stream so that each person sees what they need most to do their specific tasks.

Furthermore, each member of a manufacturing team needs a way to see the “big picture” of what all these quality and operations data indicate. Depending on what this picture shows, you might need to dive into more detail, to resolve a problem or improve productivity or quality.

To address these needs, the InfinityQS staff—many of whom are Six Sigma Green or Black Belts—applied their decades of statistical and real-world manufacturing and quality experience to design the Enact dashboard.

Figure 4: SPC solutions that filter data can help you avoid data overload.



This role-based interface comprises data tiles that surface the most important information for any given user at any given time. Enact monitors real-time data streams for processes and collections, prioritized based on the user's job and shift. Stream Summary tiles provide a visual summary of what's happening across a line or site, automatically alerting you to anything amiss, as well as enabling you to dig deeper for more details whenever you want.

Filter the data stream so that users see what they need to do their specific tasks.

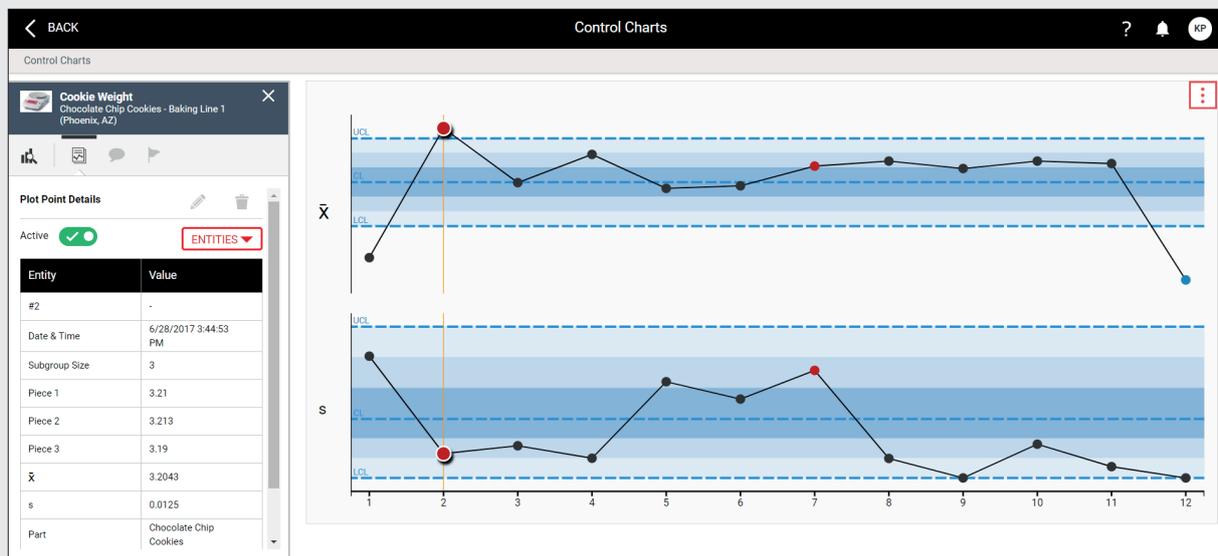
#4 Stay Fast but Flexible

The next important step in speeding your ability to gather, digest, and act on quality data involves those details. The more analytic power you have, whether on the floor or during a review of aggregated data, the easier it becomes to make the types of proactive, strategic decisions that can result in significant costs savings and productivity gains.

All SPC efforts revolve around measuring and observing process variation. Variation costs money, whether it's due to a common cause (e.g., inherent variation such as natural wear and tear, changes in humidity, aging of equipment, and so on) or issues such as operator error, power outage, or equipment malfunction. SPC provides statistical methods to predict, identify, and remove sources of variation. The more granularity and flexibility you have for analysing variations, the better.

Using an embedded real-time analysis engine, Enact processes every subgroup and data value and warns the user when statistical or specification violations are detected. Although not necessary, data stream control charts are accessible if users want to visualize the plot point patterns themselves.

Figure 5: Robust solutions surface prioritized information but let you dig into control chart details.



Variation costs money.
Statistical methods help
you predict, identify,
and remove it.

Enact enables you to slice and dice data the way you want, both to keep an eye on real-time quality and to support improvement projects such as Six Sigma. Choose from a wide variety of data views, including control charts, box-and-whisker charts, histograms, scatter plots, and more. With extensive support for flexible views and analyses, you can find the tools that lead to operational insight and better decision-making.

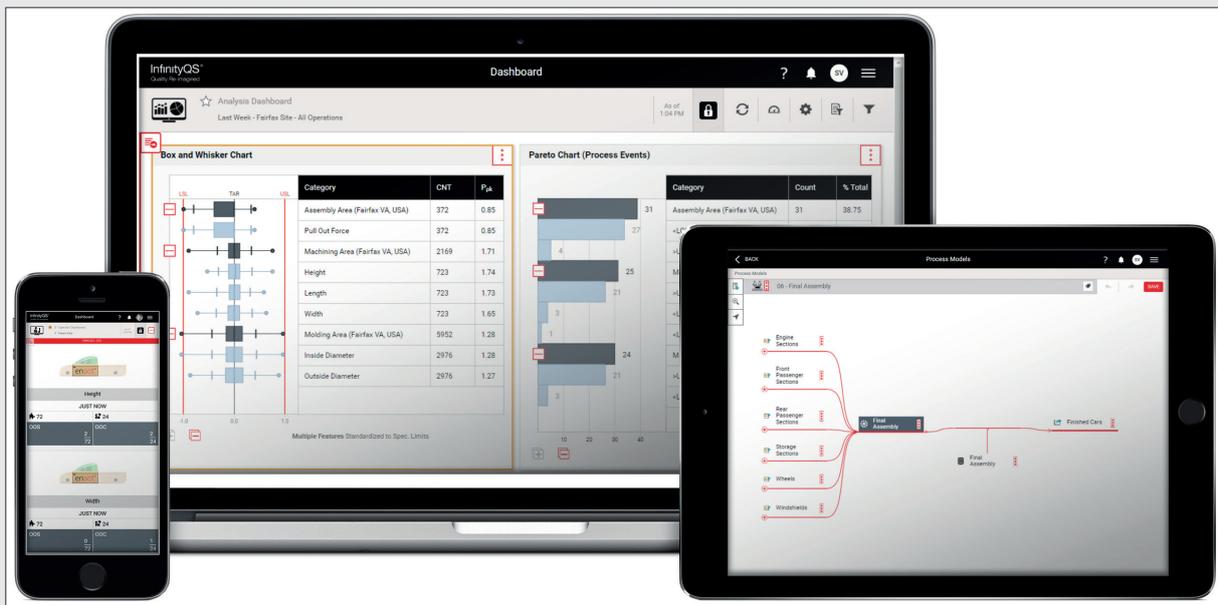
#5 Make It Mobile

Manufacturing, like all industries, is increasingly mobile. Round-the-clock operations, a global workforce, and cloud-enabled software and data storage increase the importance of 24/7 data access from any location. One benefit of this new mobility is that operators and quality personnel no longer need to be tied to a workstation or dependent on IT resources to monitor and resolve issues as they arise.

The best way to take advantage of advances in mobile access is to find a real-time SPC solution that provides mobile access as well as appropriate security and built-in help as well as additional training opportunities.

Ensure operators and quality personnel can access information from any location or device.

Figure 6: Access data from anywhere, at any time.



Enact supports mobility in several ways. Mobile Data Collection feature enables untethered, real-time data collection from any Web browser or mobile device. Approved users get instant access to all the data surrounding a given event, regardless of where and when they originate. And mobile access simplifies the communication of traceability data to vendors and suppliers.

Make Your SPC Data Faster Than the Speed of Life

Ready to power up your real-time SPC data, improve operations, and pull ahead of the competition? Apply these tips, and your process approach will be up to speed in no time. And with an SPC solution like InfinityQS Enact at hand, you'll also find yourself hurtling toward a robust return on investment (ROI) for your process-improvement efforts.

Additional Resources

- › [How Does the Enact Process Model Help Map the Critical Places to Measure Data? \(video\)](#)
- › [DYK: Timed Notifications Ensure On-Time Data Collections \(blog post\)](#)
- › [How Does Enact Work with Existing Data Collection Devices? \(video\)](#)
- › [Time to Automate Data Collection? \(blog post\)](#)
- › [Stay on Track with SPC Process Alerts and Notifications \(blog post\)](#)
- › [Dashboard-Driven Insights \(blog post\)](#)
- › [How Does Enact Deliver the Right Content to the Right People? \(video\)](#)
- › [Enact the Factory of the Future \(video\)](#)
- › [Going Mobile: How the Cloud and Real-Time Data Are Changing Manufacturing \(webinar\)](#)
- › [You Have the Software. Now, What About the Training? \(blog post\)](#)



About InfinityQS International, Inc.

InfinityQS International, Inc.[®] is the global authority on data-driven manufacturing quality. The company's Manufacturing and Quality Intelligence solutions deliver unparalleled visibility across the enterprise, from the shop floor to the boardroom, enabling manufacturers to Re-Imagine Quality and transform it from a problem into a competitive advantage. Powered by centralized statistical process control (SPC) analytics, InfinityQS solutions provide operational insight to enable global manufacturers to improve product quality; decrease costs and risk; maintain or improve compliance; and make strategic, data-driven business decisions. Headquartered near Washington, D.C., with offices in Seattle, London, and Beijing, InfinityQS was founded in 1989 and now services more than 2,500 of the world's leading manufacturers, including Ball Corporation, Boston Scientific, Graham Packaging, and Medtronic. For more information, visit www.infinityqs.com.

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