CHALLENGE

Collaborate more efficiently with contract manufacturers to consistently produce a more reliable product.

SOLUTION

Using statistical process control charts in JMP, Tellabs is working with contract manufacturers to better ensure the consistent quality of its products. Tellabs incorporates predicted yields into P charts that are used to indicate the anticipated outcomes in the production process.

RESULTS

Tellabs uses JMP in weekly meetings with contract manufacturers to pinpoint issues that can likely be effectively addressed. Having learned to use JMP scripts to create charts and reports, the contractors now arrive at the meetings prepared to discuss any issues at hand.

Opening the lines of communication

Tellabs uses JMP® to improve collaboration with contract manufacturers

Vin Kane likes quite a bit about JMP®. He has, after all, used the statistical discovery software from SAS for more than a decade. As a quality reliability consultant at Tellabs, he introduced the telecommunications company to JMP about seven years ago.

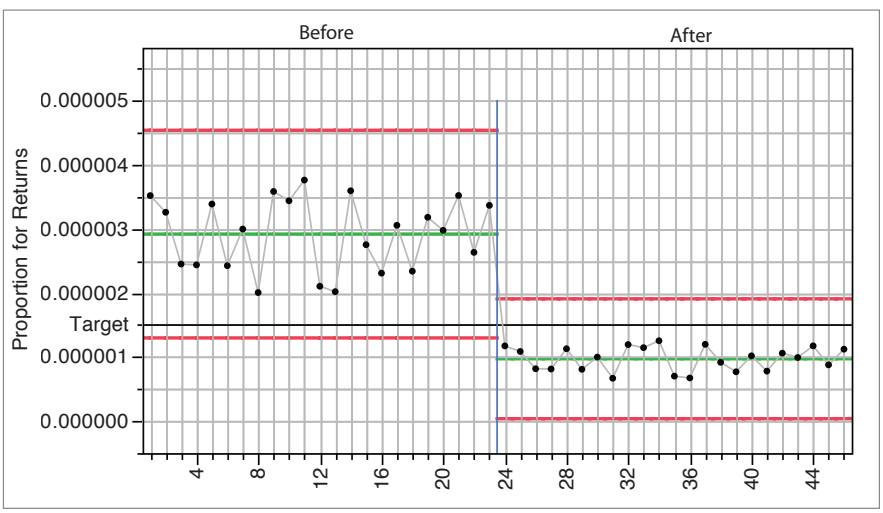
Kane knows that JMP is invaluable in making more effective and efficient use of statistics for improved production performance and in presenting the results of analysis to clients and management – that it provides insights beyond those afforded by other analytics software.

But it is the software's power to enhance communication and collaboration with contract manufacturers and Tellabs customers alike that Kane appreciates most.

Tellabs innovations advance smart networking for 80 percent of the world's top communications service providers. Established in 1975, it employs about 2,650 people.

"We, like almost every large enterprise in this industry today, work with contract manufacturers who take a design and component list and assemble a product," says Kane, who is responsible for monitoring contractors' production processes.

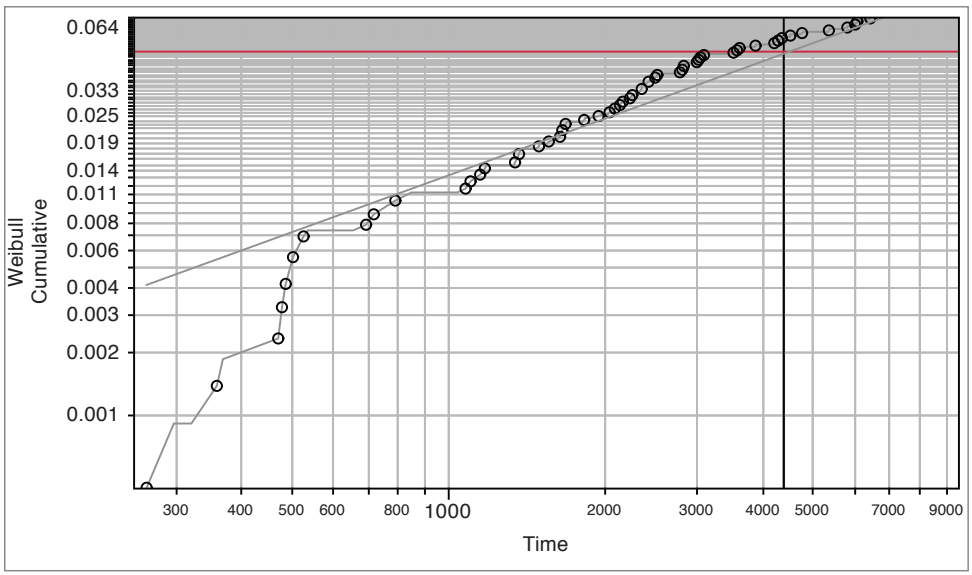
"For the most part, the manufacturers use statistical process control to monitor those processes," Kane says. "We'd see a nice yield chart, but frequently the question would arise as to whether we were working at the right process level.



P chart with "Target" shows when in control is not good enough.

"JMP provides us with a good instant visual as to what needs to happen next. It helps us find the root cause."

Vin Kane
Quality Reliability Consultant
Tellabs



Target cumulative failure rate of repaired product to be "as good as new."

"If we get a yield at 95 percent, is that the right number? Or should we expect more?"

Here's the evidence

So Kane and his colleagues began to take a closer look at the processes used to build Tellabs' products. A product often comprises 4,000 or 5,000 components on a single circuit board, and the assembly process involves multiple stages.

"In most cases, a contract manufacturer will express the process capabilities in terms of CPKs, which is an industry term for measuring the health of a process," Kane says. "CPKs in values of 1.5 or better are generally assumed to be running close to Six Sigma."

Kane now uses JMP to express a predicted yield. The number of components in a product and its CPK are factored in to predict what the yield should be. Using JMP, that yield is then incorporated into a P chart to indicate what should be expected of the process.

"This gives us instant verification of whether we're at a yield that we expect to be," Kane says. "If we get a yield that's statistically different than what that target yield tells us, we need to determine where the discrepancy is."

Kane found that most of the contractors he worked with used a competing statistical package. "We asked them if they could modify their charts to incorporate the expected yields so that we'd have that additional visibility, but they were unable to do it," he says.

So Kane introduced them to JMP.

"JMP gives us a much more integrated report and produces what we need."

He's using JMP in meetings now: "We have weekly contractor manufacturing improvement meetings, and we'll give the contractor the JMP scripts, educate them on how to use them, and then they'll use their data with the scripts to produce the charts and reports. Then they'll bring them to the meetings and discuss the issues at hand."

Sometimes the Tellabs team and their contractors will do on-the-spot analysis in those meetings, but for the most part, the contractors are expected to arrive with issues that they've already begun to resolve.

"What we want them to do is recognize where there is an issue, rather than us bringing it to their attention because a customer complained, or we discovered on the floor that they're not meeting their yields," Kane explains. "JMP helps them to manage their own destinies, to meet our standards and be successful."

JMP provides the evidence. "You can see the numbers we're aiming for. If your process is capable of those

numbers and you're not getting them, it's up to you to take the lead in discovering where the issues lie."

JMP® in action

Kane appreciates the dynamic functionality of JMP – the ability in those face-to-face meetings to put the software into action, to drop and drag variables and to examine options on the fly.

The contractors now take a proactive role in using JMP's capabilities to improve efficiency. For example, they suggested creating a subset of charts that includes only those processes where the yield is in question.

"That's been a great help. Before, they would come to the meetings and have all the products that ran that week, all the yields, and we'd look for anything that might look suspicious. That wasn't the most efficient use of their time or ours."

'Instant visual'

The approach that's applied to the production line also works in the field, guiding Tellabs' communications with its customers.

Tellabs establishes predicted return rates based on the inherent failure rate of each product. It teams with its customers to monitor and try to improve on those rates.

"The customer might say, 'We sent you five returns this month. Can you tell us what you did to improve on that?'" Kane explains.

The chart may indicate that the product is performing as well as can be expected. "A good, reliable product doesn't mean that it's failure-free; it just means that the failure rates are within the expected number.

"That's gone a long way in managing expectations with our customers."

Tellabs also uses specific feedback from the return process to inform research and development efforts.

"So we're now better able to take the right action for the right reason, and not just think, mistakenly, that we're going to improve the reliability by changing out a component, when it really wouldn't do much.

"JMP provides us with a good instant visual as to what needs to happen next. It helps us find the root cause."

Kane has now put JMP into the hands of Tellabs' employees in the field, those who handle repairs and returns and must assure product reliability. The JMP partitioning tool is used to isolate potential sources of a product's downtime, and its performance is then monitored.

"We'll identify the significant issues using the partitioning tool and then manage those variables a little bit better."

It's one more way, Kane says, that JMP is, "no doubt, critical to our work."

SAS Institute Inc. World Headquarters **+1 919 677 8000**

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