JMP CUSTOMER STORY

PPG

At PPG, a fresh take on Six Sigma

CHALLENGE

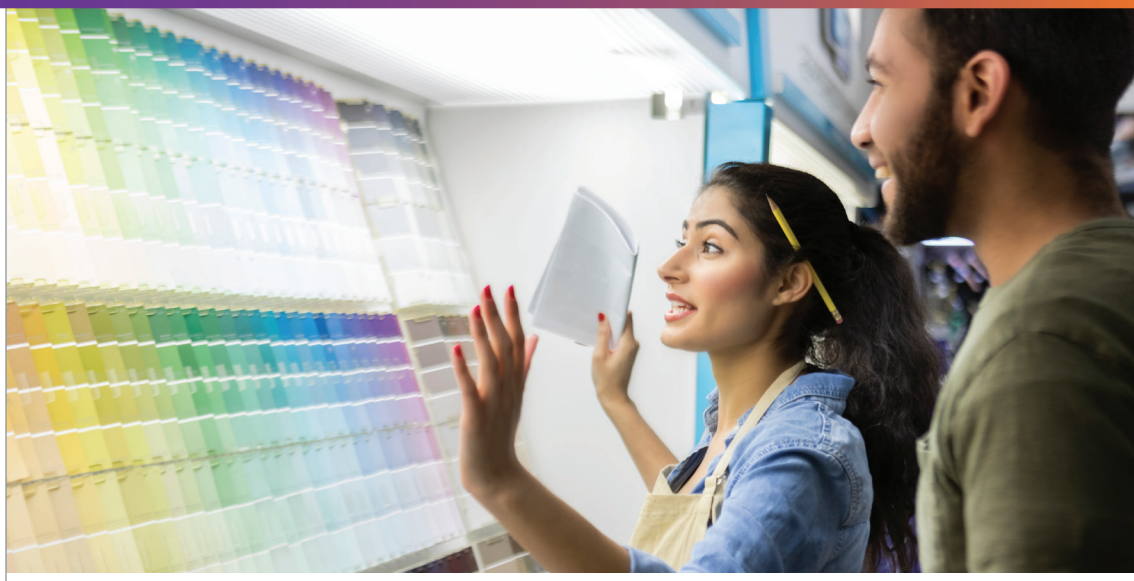
With a highly skilled but diverse talent base, operations around the world and a trend toward increasing automation, change agents at PPG recognized an opportunity to evolve the organization's long-standing Six Sigma tradition in line with the new realities of the digital era.

SOLUTION

Democratize the principles of Six Sigma by providing JMP® to anyone who wants it. With this user-friendly yet powerful tool in hand, domain experts are empowered to adopt statistical best practices that boost efficiency and scientific reproducibility, regardless of their statistical skill level. A multitiered approach to analytics in turn frees up Six Sigma Black Belts and IT managers to focus on PPG's most complex, value-adding challenges.

RESULTS

At PPG, a single companywide analytics program is a global language for quality engineering and design of experiments. The company's widespread analytics enablement has helped to build momentum for collaborative initiatives and innovations that more fully utilize the company's expert talent.



The democratization of statistical best practices compliments domain knowledge to speed innovation and deepen collaboration between PPG sites around the world

The chemical industry has a long history with Six Sigma, beginning shortly after the philosophy was first operationalized in the early 1990s. Since then, the industry has undergone a series of major shifts, first with technology, then, automation and digitization, yet many organizations' Six Sigma traditions have endured with comparatively few changes.

Global leader PPG Industries, however, is bucking that trend.

A Fortune 500 company and major worldwide supplier of paints, coatings, optical products and other specialty materials, PPG employs nearly 50,000 people at more than 150 facilities around the world. Ensuring quality for such a large global industry requires attention to detail, cross-company

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> **Dave Sartori**
> Senior Data Scientist

jmp STATISTICAL DISCOVERY FROM SAS

standardization and common, easily accessible, modifiable platforms. That's why leaders in PPG's Six Sigma movement two decades ago have now jumped at a new opportunity to adapt the company's analytics culture to the way people are working in 2021.

Democratizing the Six Sigma philosophy to domain experts

As laboratories and factories become increasingly digitized, scientists and engineers are generating more and more of their own data. Whereas traditionally domain experts may have called upon a Six Sigma Black Belt to support occasional data challenges, the sheer abundance of data in modern R&D and manufacturing environments renders the standard consulting model insufficient for the scale of the demand.

"I was in the first wave of Six Sigma at PPG," recalls Senior Data Scientist Dave Sartori. At the time, he explains, Six Sigma was a relatively new concept and PPG's program drove quality improvement through a consulting framework. Black Belts provided industrial statistics support to peers in various departments and offered training to anyone who self-nominated to a Green Belt program.

In light of the data revolution, Sartori says, PPG has embraced a new role for Six Sigma – on a much greater scale than ever before. When domain experts apply the principles of Six Sigma — however rudimentary — to their work, efficiency and reproducibility increase, as does the value to the company. Basic statistical approaches to experimentation like design of experiments (DOE) have had an outsize impact on time and cost savings when deployed to domain experts. "So our primary target audience is scientists who are doing experiments," explains scientist Kevin Gallagher.

Furthermore, with statistical methods in place in labs and factories across PPG's global organization, the company has found new ways to optimize scientific and engineering talent utilization. That optimization extends also to Sartori and his fellow Black Belts who now spend less time resolving low-level statistical questions and can instead devote their attention to complex challenges with the greatest potential value.

Training options for scientists at all statistical skill levels

Transformations like this don't happen overnight, however, and internal training efforts have played an outsize role in upskilling individuals at all skill – and interest – levels. Sartori explains that PPG's training is designed around case studies wherein examples drawn from the company's own data produce quantifiable results, reduce skepticism and engage domain experts. Applications-focused training appeals especially to those with little to no statistical background, as it encourages them to work from the data they already collect. Courses break up the theoretical aspects of learning statistics in a lab setting where colleagues work in small groups to debrief each other and learn together at their own pace.

"In addition to myself, there are 19 other people doing parts of the training now," explains Gallagher. "It's not that we couldn't do the training with fewer people, it's that we want to present more mentorship opportunities. [Conducting a training] gives people an opportunity to hone their skills a little bit further by getting in front of 60 other scientists. Scientists are really good at asking probing questions that will make the instructor think and have to come back and dig a little deeper sometimes."

Gallagher and Sartori explain that the key to the success of PPG's training initiatives has been the simultaneous rollout of new tools that advance the democratization of analytics. Existing tools were relatively inaccessible, and a user-friendly alternative was critical to incentivizing domain experts to learn and adopt new strategies.

"Once we decided to internalize training, we wanted to make sure that people came away with additional skills, not just knowledge – that they were able to actually do some of the things [we were teaching them about]," Sartori explains. "We thought making JMP available and making that a critical part of the training, in terms of actual applications, was an important point in making our training plan [succeed]."

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> **Kevin Gallagher,** Scientist

A user-friendly but sophisticated statistical discovery software, JMP has, since its rollout at PPG, been a big factor in the company's ability to democratize the spirit of Six Sigma to all departments and geographies.

"When we're doing these classes for our science and technology audience, we tend to standardize it around JMP because of the visual connection between an analysis and graphics – and the dynamic nature of JMP that allows users to explore," says Gallagher. Now with an enterprise licensing structure, the company can easily deploy the tool to anyone who needs it. "The advantage of having a JMP corporate license is that we can have people add it at a low cost on a monthly basis," he explains, and the license is paying for itself in cost and time savings many times over.

Professional development opportunities help attract new talent

When analytics coursework was first extended to those outside of the standard Green and Black Belt certification culture at PPG, many domain experts were slow to sign up. However, Gallagher and Sartori say that interest has snowballed with growing momentum around analytics enablement. And with more scientists having gone through a training course and begun using JMP, new hires are seeking out upskilling upon their arrival at PPG. It's a professional development opportunity that the company not only offers but encourages, and many are taking advantage.

"There's a culture of [scientists] using these tools, and when they see it, new hires are curious about what they might be missing out on. So they come to us asking to take our classes," Gallagher says. "We catch them when they're fresher in the industry and hungry to learn, and since they're doing a lot of experimental work; what we're teaching them is highly applicable."

These upskilling opportunities also have knock-on implications for PPG's ability to recruit and retain the industry's brightest new talent. Scientists and engineers fresh from graduate programs seek careers with organizations that embrace the latest methods and technologies, and PPG's training and professional development opportunities deliver. The popularity of these programs, Sartori credits in part to JMP; "we've been so successful because we are giving them skills and a tool that they can use."

Meeting people at their level is part of the broader strategy to deepen analytics culture. Not all scientists need to have advanced statistical skills – and likely don't have time to invest in learning advanced methods not needed for their roles. Others carve out new roles for themselves as proponents of analytics within their team and therefore pursue additional trainings, whether through PPG or through JMP via the JMP online user community, Mastering JMP webinars, white papers and JMP conferences.

JMP, Gallagher and Sartori say, caters to a diverse user base. Statistical novices may use only a fraction of the functionalities available – spending most of their time in the interactive Graph Builder platform, for example – while advanced users use scripting to build dashboards and streamline repeat analyses in ways that can be shared with others performing similar tasks. It's yet another way of standardizing around best practices and boosting the reproducibility that is so critical to technology transfer. And the ability to use JMP out of the box as well as to script customizations makes JMP an all-in-one tool that everyone can utilize at their own comfort level.

A common tool enhances collaboration across geographic areas

Statistics is a global language, and global companies like PPG are today finding that a wave of analytics literacy among scientists and engineers around the world is deepening communications across geographies. Having a common platform like JMP for statistical work only deepens these collaborations, as colleagues in different parts of the world can easily transfer analyses, share scripts and work from the same interactive visualizations, communicate challenges and find variability within a project.

"Regardless of whether someone is across the hall or across the ocean, if you're looking at a JMP file together, you can drop some scripts in and find ways to extend the analysis," Sartori explains. Use of a common tool accelerates the pace of development by eliminating data access issues and the need to switch between programs or convert data formats. And the extension of scripted analyses and dashboards mean analysis can be run in the same way – and easily quality checked – in different facilities.

"Once people get familiar with being able to look at [something in JMP] – a variability chart, the Prediction Profiler, DOE – then these different labs can say, 'I ran this DOE, this mixture design, and now we're looking at the Contour Profiler.' And everybody understands how to interpret the graphics," says Gallagher.

"We leverage JMP as much as we can, because it's kind of like the Swiss Army knife of statistical tools – it has a lot of capabilities." And for a company like PPG with its 150 facilities worldwide, he adds, "in a sense it is JMP's application of the statistics and graphs and mathematics that cut across all the different languages. Ultimately, that improves collaboration."