When it comes to defects, intolerance is good

BY ANNE MILLEN PORTER

It's impossible, these days, to have a conversation about supplier performance measurement without hearing the words Six-Sigma bandied about.

Very often, however, the phrase is used only in its narrowest sense, as in: "Our goal is for suppliers to reach Six-Sigma quality performance, or 3.4 defects per million parts. Anything higher and we penalize them in our total-cost-of-ownership calculus, adding to their bid prices what, we figure, their quality defects cost us over the lifetime of our products."

This misses the point entirely.

Six-Sigma tools and disciplines, as applied to the supply chain, aim to quantify and qualify concepts like total cost of ownership. In the ultimate Six-Sigma vision, performance to customer requirements is always near perfect, so there's no such thing as 'cost of quality' or 'cost of non-performance'. When business processes begin to operate with extremely predictable results—as Six-Sigma adherents would have them do—then uncertainty-driven costs, such as those associated with proliferated supply bases, redundant design, expediting and follow up, inventory investment, material review boards, inbound inspection, and high-cost logistics practices, can be reduced or eliminated as well.

That's the vision anyway. Many who have attempted to expand Six-Sigma disciplines from the manufacturing floor into their supply chains have found themselves working hard to overcome challenges and achieve meaningful results. Quite often, according to **Steve Trecha** , President and CEO of Integrated Strategies, a supply chain-consulting firm based in Okemos, Mich., these struggles originate with a too-narrow view of customer/supplier relationships.

Trecha, together with **Steve Dickinson** , Six-Sigma Master Black Belt and President of Integrated Strategies' Six-Sigma practice, and **Jim Bradley** , Vice President of the firm's Supply Chain practice, spoke recently with PURCHASING about how they "supercharge" supply-chain strategy development using Six-Sigma tools and disciplines.


Steve Trecha


Steve Dickinson


Jim Bradley

Q: In context of a total supply chain strategy, how do you define and deploy Six-Sigma?

A: We use five principles. The first is zero tolerance for defects—3.4 defects per one million opportunities, which is virtually defect-free. The second principle has to be lowest life cycle cost, as you can get to zero defects at a cost no one is willing to pay. The third principle is being completely customer-centered, always delivering value as the customer defines it (as in quality, cost, delivery, etc.). Safety—for example, protecting people, equipment—is the fourth principle. The fifth principle is organizational responsibility, which includes things like business ethics and governance. Organizational responsibility is one of the things that get you from short- to long-term successes.

Q: So, in applying Six-Sigma disciplines to the supply chain, where do you start?

A: Applying Six-Sigma effectively is a five-step process. First, we use Six-Sigma analytical tools and methods to develop supply chain strategies and policies that support what an organization is trying to accomplish. Before metrics and tools come in to play, it's important to understand how the organization defines supply chain and determine if senior management is ready to run the business in a truly integrated, cross-functional fashion. An internal review answers the question of how aggressive the company wants to be about advancing its supply chain using Six-Sigma. The second step is to define all customer/supplier relationships and requirements, both internal and external customers.

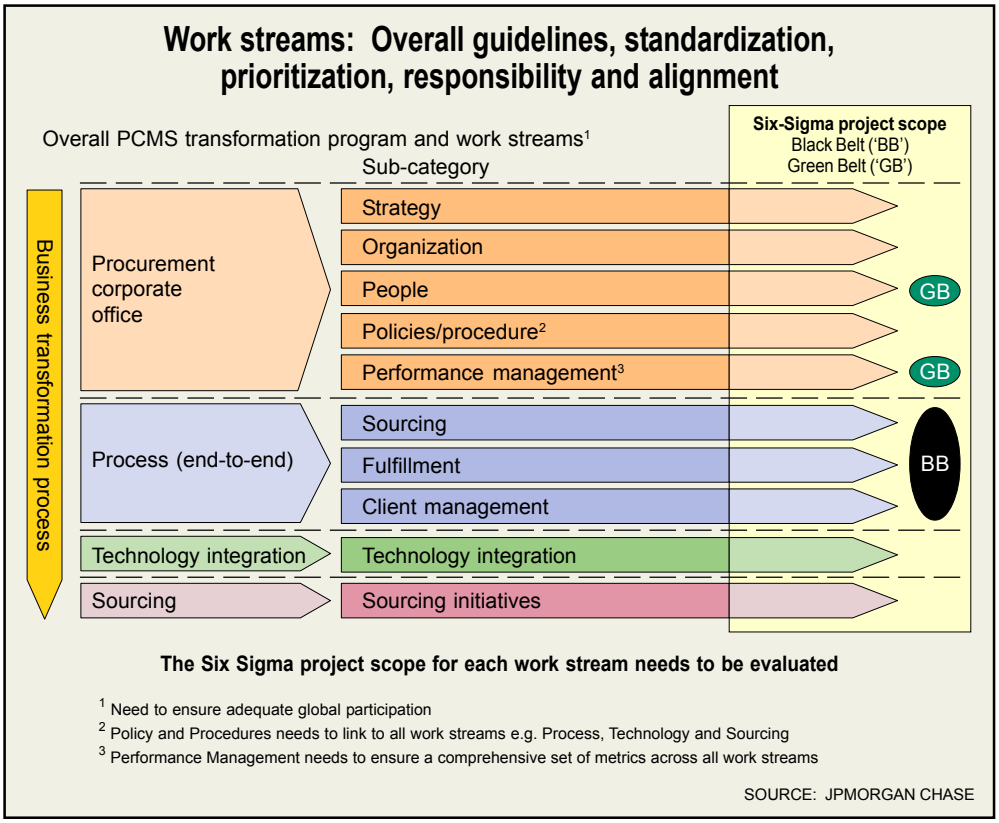
Six-Sigma defined

Six-Sigma is a quality management concept based on a statistical measurement term (6σ), which is the sixth standard deviation on a normal distribution curve, signifying the ability to catch defects 99.9999998% of the time. The traditional approach follows five steps. **Define.** Develop a team, gather the "voice of the customer," conduct competitive analysis, and develop measures. **Measure.** Identify functional requirements and alternative concepts, evaluate alternatives, select a best fit concept, and predict sigma capabilities. **Analyze.** Use benchmarking, process capability information, and statistical approaches to tolerances. **Design.** Develop design elements, predict performance, and optimize designs. **Verify.** Test and validate the design via a pilot study. Provide feedback on results to participants.

Q: Can you elaborate on what you mean by internal customer/supplier relationships?

A: Confining your attention to traditional buy-sell relationships is inadequate for driving total supply chain performance. Defects occur at many points in the supply chain, and any single defect can hurt the performance of the whole. At every link in the supply chain, you have to ask: Who is the supplier? Who is the customer? And what are the customer requirements?

For example, a Quick Service Restaurant (QSR) chain ran out of chicken because its supplier didn't know it was launching a big marketing promotion. The root cause of that breakdown was internal—defective forecasting and poor communication between marketing and purchasing. Another QSR chain got stuck with a significant quantity of material after a big marketing promotion and were forced to sell it off at just 10 on the dollar. In both cases, marketing was the supplier, purchasing the customer.



JP Morgan Chase used Six-Sigma methodologies to transform its procurement organization from a nonstrategic, transaction-oriented focus to a strategic one. The group has seen initial savings of about 15% and sustainable (year over year) savings on the order of 10%.

The customer requirement was accurate forecast data.

What's more, the notion of customer/supplier relationship needs to be expanded beyond just people. For example, materials organizations (suppliers) typically meet maintenance organizations' (customers) requirements by building inventories of replacement parts. But the maintenance organization isn't really the customer; rather, the customer is the machinery itself.

A common application for Six-Sigma tools and disciplines is to identify problems and fix them. The ultimate application is to be predictive so you can eliminate costs, like inventory costs, that are associated with uncertainty. You can, for example, devise statistical methods that show—based on infrared, heat or vibration detection technologies—when a machine is starting to progress from optimal health (performance) toward breakdown. From there, you can predict when the breakdown is likely to occur, say six weeks out, which allows you to schedule preventative maintenance, say four weeks out, and to know precisely when you will need the parts and resources to perform the repair. From there, you begin to establish supply chain policies such as setting supply programs or stockroom limits and systems for automatic ordering or stock replenishment, which, in turn, allows you to reduce inventory, etc.

Q. So after you define all these customer/supplier relationships, what's next?

A. Our third step is to develop product and service characteristics from which performance measurements can be designed. For example, order fulfillment, capacity utilization or information accuracy measures. Step four, measuring performance, shows where the defects are occurring in supply chain processes, which brings you to the fifth step—the one that typically gets all the attention—where you start figuring out how to fix processes, how to control them in ways that consistently produce defect-free results. All the glory comes in step five, but the foundation is built in steps 1-4.

Q. It has been said that Six-Sigma disciplines are good for fixing decent processes, but less useful for deciding if processes need to be scrapped or completely redesigned.

A. The most difficult question that Six-Sigma Black Belts face is when to fine tune or fix processes and when to blow them up. You start by creating a detailed process map, then focusing intensively on where in the process things are going wrong. On one occasion, for example, we went into a plastics factory that had been experiencing significant scrap problems and blaming the issue on suppliers. Our analysis showed a substantial portion of the scrap was occurring on just two of the company's eight production lines. Had suppliers or the basic process been at fault, the problem would have been distributed across all eight lines. In that case, the process was fine, the two lines needed to be fixed.

In a contrasting case, we created a process map for a hospital where the average waiting time for outpatient registration was 47 minutes. In mapping and analyzing their process, we identified 340 different problems that were keeping people from being registered quickly. Clearly, that process needed to be blown up. By seeing outpatient registration as the supplier to other hospital departments like X-Ray, CAT scan, etc., where expensive equipment sits idle if patient registration is delayed, we were able to design a new process that improved information sharing and flow and reduced the average wait time to just 90 seconds!

Q. Is there a danger in Six-Sigma of applying rocket science where simpler tools and techniques will suffice (and cost less to deploy)?

A. We recently had e-mail from a colleague who had gone to work for a new company. This person observed that people in the new firm seemed more concerned about using their tools than fixing problems. You avoid that by training people to always focus on delivering business results. Six-Sigma processes can be very complicated. In undertaking the training, you receive a very large toolkit, but you don't use every tool, every time. Your success as a Black Belt often depends on being able to reach into that toolbox and pull out the right tool.

Get a Six-Sigma Supply Chain Strategy Development Template compliments of Integrated Strategies. Call Steve Trecha at 517-381-4800 x219 or email at strecha@sourcing.com.

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