

# Value Analysis & Standardization:

*Systematic steps to support system-wide change*

This newsletter series is sponsored as a service for the value analysis, contracting, and materials management professionals by C. R. Bard, Inc.

NOVEMBER 2008

## SIX SIGMA

### Greetings from Carol Stone

This issue of the newsletter focuses on Six Sigma, the data-driven problem solving methodology for improving business and organizational performance. First applied in manufacturing companies, Six Sigma has been adapted to, and adopted by, many service and transactional organizations such as banks and hospitals.

Inside you'll find a brief primer on Six Sigma: what it is, how it came about, and how it can be used to identify, analyze, and resolve roadblocks in your business processes. We've also included some tips, a few "tools," and a "Q&A" with Michelle Allender Smith of Bon Secours Health Systems in Maryland, a Six Sigma "green belt" who has experienced both the benefits and the challenges of employing the methodology to improve cycle time in her department.

For those of you who may be new to this newsletter, you'll also find a list of past newsletter topics, all available for the asking. And, as always, if you know someone else who would like to receive future issues, please email me at [carol.stone@crbard.com](mailto:carol.stone@crbard.com) and we'll add them to our mailing list.



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# SIX SIGMA:

# THEORETICAL PERSPECTIVE

Originally developed as a data-based process improvement methodology, Six Sigma has evolved into a management philosophy that can be used throughout all areas of an organization to solve business problems.

A management fixture since the 1980s, Six Sigma is, quite simply, a structured methodology used by businesses to improve the way they do things. Driven by data, it is – to quote one authority – “a relentless pursuit of reality, coupled with processes for constant improvement.”

## Core Assumptions

According to the *Six Sigma Leadership Handbook* by Thomas Bertels, Six Sigma is based on a set of core assumptions:

1. That problems are best solved through data-driven analytic problem solving procedures
2. That small collaborative teams of individuals with firsthand knowledge of the problem and led by trained facilitators are the best units for finding solutions
3. That everything cannot be improved at once but on a project-by-project basis
4. That energy should be focused on improvement, using a hierarchy of trained personnel with specific roles
5. That measurement and metrics are critical and
6. That top management must understand the fundamentals of organizational change/improvement and actively lead and support

## Standard Deviation

Developed by engineers at Motorola, Six Sigma was first used to improve quality by implementing a common method of counting defects. “Sigma,” the eighteenth letter of the Greek alphabet, is the statistical term used to express standard deviation, that is, how much variation exists relative to customer expectations. It can also be used as a quality measure. A “sigma” of six, for example, is equivalent to 3.4 defects per million opportunities. In other words, near perfection.

*Six Sigma utilizes a systematic methodology to:*

1. Identify the problem
2. Set the goal
3. Find the process causing the defect
4. Validate that the defect exists and to what extent
5. Determine the cause(s)
6. Identify and test the solution

## Hierarchy of Personnel

**It does this through a hierarchy of personnel that includes:**

**A champion** who is responsible for selecting the project to be undertaken, assigning resources, approving project direction, and eliminating roadblocks;

**A project leader** who works with the champion to define and identify resources, and then directs the project; and

**A knowledgeable team** made up of members who understand the area and process with which the problem is associated.

As in karate, Six Sigma leaders (known as “belts”) are color-coded according to their level of training. For example, black belts undergo more training than green belts and typically handle multiple projects or partner with other black belts on larger projects (known as black belt projects). Green belts would be responsible for projects smaller in scope and within their areas of influence, usually where they currently work.

## Process Management

In essence, Six Sigma is a form of process management (where a process is defined as a series of operations performed to bring about a result). Everything we do is part of a process. However, as we all know, processes have a tendency to become more complex and less efficient over time. What started out as a simple workflow can become overburdened with forms and signatures, ad hoc changes, and workarounds. Variation is always present at some level in every process. The goal is to minimize it through consistency, ideally before it becomes (or creates) a problem.

*The Six Sigma methodology was created as a way to evaluate more easily when and where improvement is required. Substitute the words “errors” for “defects” and “transactions” for “opportunities,” and you can understand how companies started looking at Six Sigma as a way to quantify and improve quality all across the organization. ❖*

## What makes a good project...

- Must be a headache
- Must be measurable
- Must be attainable
- Must be quantifiable in a reasonable time

**T**he increasing cost of health care and widespread staffing shortages provide a strong incentive to look for ways to improve the performance of healthcare delivery systems such as hospitals, managed care organizations, and other elements of the complex healthcare system. Six Sigma can serve healthcare providers in many ways, primarily through delivering better care to more people at a lower cost and helping to attract and retain staff. (Bertels, *Six Sigma Leadership Handbook*.)

## A Combination

As you may already know from firsthand experience, Six Sigma is a combination of people and process, teams and tools – and much of it may be familiar to you already as Six Sigma is what one authority refers to as an “umbrella” initiative. That is, it utilizes many tools and processes found in other quality or improvement initiatives. People play a huge role in the success of Six Sigma. They manage projects, participate on teams, encourage project creation and, in the end, support (or undermine) the changes brought on by results. Tools are the techniques that the teams employ in order to solve the problem at hand. There are many tools; one author lists more than 200. Of these, the most important is the Six Sigma project.

## Ideas

Six Sigma project ideas can come from anywhere. Many originate from the executive level, especially if there is a fear of not meeting a number or metric outlined in the performance plan. Others can come from customer complaints – and Six Sigma defines a customer as anyone receiving the output or end result of your process, whether it’s a report or on-time delivery of medical supplies. Employees are the best source for identifying problem areas that can serve as a

source for project ideas, so be on the lookout for anything not working as well as it could be.

## A Variety of Uses

As a Value Analysis Professional, your work impacts many areas of your healthcare organization. Therefore, in addition to projects in your own department, you may be called upon to serve as a team member on projects that are looking, for example, to reduce inpatient length of stay, ER wait time, outstanding account receivable days, or even fall and injury claims. Other Value Analysis Professionals have found it useful in clinical transformation, that is, moving clinicians in new directions, and suggest that Six Sigma can also be helpful in dealing with new rulings, such as those from Centers for Medicare and Medicaid Services (CMS), that require the cooperation of doctors, nurses, materials managers, and purchasing to identify clinical issues that need to be transformed.

*Six Sigma requires a superior criteria-based selection of projects that have a high probability of success. They always:*

- *focus on the customer*
- *use data to make decisions*
- *include planning before action*

## Training

If you have been chosen to be on a Six Sigma project team, it is most likely because you have demonstrated leadership capabilities or functional expertise. You will be asked to attend training. If you have been tapped as a green belt, that could take as much as five full days over four months’ time, with a six month or longer window to complete your project, depending on

the project scope. Additionally, there might be an exam that you must pass with 75% or better in conjunction with completion and defense of your green belt project.

## Four Stages

According to authors Marsha Shapiro and Anthony Weeks, teams go through four stages:

- forming** (*coming together*)
- storming** (*internal conflicts*)
- norming** (*becoming operational*), and
- performing** (*focused and motivated*)

*As a team member, your role is to:*

- Attend regular meetings
- Be open to new ideas
- Actively participate in team discussions
- Be a communication champion
- Complete tasks on time

After your initial Six Sigma training, much of your work will be done on your own or with your team with coaching from your black belt resource as well as the Six Sigma instructor, and routine reference to class notes, materials provided during class, and other references.

## DMAIC

As a member of a Six Sigma project team, you will be trained to use a variety of “tools” of which the most commonly used is the DMAIC (pronounced duh-may-ick) process. This is the Six Sigma improvement methodology used to define, measure, analyze, improve, and control (DMAIC).

It consists of five sequential steps:

- **Define** – This is the first part of the team’s assignment. It begins with completing a project charter that identifies the problem, customer needs, the quantifiable goal, a time frame, and necessary resources.

- **Measure** – To determine how widespread the problem is, the team creates a baseline by collecting enough data to explore possible causes. Measurements are fundamental to Six Sigma.
- **Analyze** – The team narrows its focus on a distinct set of issues and opportunities by looking more closely at the data, selecting theories to test, and performing hypothesis tests to find root causes.
- **Improve** – The team generates ideas, designs, and pilots, then implements, improves, and validates them.
- **Control** – The team evaluates the impact of the project by collecting performance data, then taking steps to institutionalize the change and sustain the gains.

## Tools

You will be familiar with some of the tools that you encounter along the way, for example, brainstorming, work plans, and process maps. Others may be new, such as:

**Critical to Quality Matrix (CTQ)** – Used to identify the customers that are impacted by the service or product in question, translate customer needs into measurable CTQs in business operational terms.

**SIPOC** – (*Supplier, Inputs, Process, Output, Customer*) – This is a high level map showing suppliers for the process, the inputs received from them, and the process that adds value to those inputs. The process produces an output that meets or exceeds customer requirements. This is applicable for both products and services processes.

**Pareto Chart** – An analysis using the “Pareto Principle” which states that in any group of factors contributing to a common effect, relatively few of the contributors account for the bulk of the effect. The 80/20 rule.

*In order for Six Sigma to fully succeed, it must be embraced by the entire organization to the point that it becomes part of the organizational culture. Implementing Six Sigma in the healthcare industry requires obtaining the buy-in of the professional staff (doctors and nurses) and making sure they understand that Six Sigma is a scientific approach that can provide consistent protocols without replacing their expertise. Selecting – and including – the right team members and creating an effective new process helps to eliminate resistance to change. ❖*

## Roadblocks to Progress

*The primary goal of a Six Sigma project team is to generate results that eliminate the cause of the problem without creating additional problems, problems that often arise out of resistance to change.*

**The Six Sigma Tool Navigator lists several types of resistance:**

- ◆ **Technical resistance**, triggered by feelings of inadequacy or stupidity when confronted with the new process
- ◆ **Political resistance**, triggered by fear of real or perceived personal loss
- ◆ **Organizational resistance**, triggered by issues of control, pride, sense of loss of ownership
- ◆ **Individualized resistance**, triggered by fear and emotional paralysis because of high stress

Resistance can come in the form of rumors, backbiting, or obstructive behaviors such as missing meetings, being late with assignments, or an out-and-out refusal to participate. It is best addressed through communication. All groups affected by the upcoming change should be provided updates – either verbal or written – and if necessary, one-on-one meetings designed to understand what is causing the resistance. Then enlist their aid. Because change can cause feelings of uncertainty (which can lead to resistance), call on them to help create new procedure documents or job descriptions. If technology is involved, classroom training can help win over reluctant advocates.

## LEADING SIX SIGMA

*If you have been chosen to head a Six Sigma project, yours is a leadership role.*

You will be called upon to persuade, connect values and action, actively listen, be a devil's advocate, articulate shared goals, build co-operation, engage in honest dialogue, provide feedback in real time, be willing to be a catalyst for change, seek constant improvement, take risks, eliminate fear of failure, emancipate action for change, be willing to experiment with an open mind, possess entrepreneurial imagination, embrace error with an attitude of improvement, and be ready to respond to the future.

*For yourself and for your team, you must:*

1. Go beyond the current form of believing and acting
2. Provide a space of openness, caring and respect
3. Listen to understand other perspectives
4. Share candidly with others
5. Maintain confidentiality
6. Participate fully in all presentations
7. Develop and commit to a plan for your organization's growth and development
8. Be a true transformer

*(From Six Sigma for Financial Professionals)*

# VA People *Viewpoint*

## Meet Michelle Allender Smith



A registered nurse with more than 24 years of experience in the healthcare arena, Michelle Allender Smith began her career as an OR technician at Johns Hopkins Hospital in her hometown of Baltimore, Maryland. She holds an

Associate degree from Baltimore Community College, a Bachelor of Science degree in Nursing from Coppin State University, a Masters degree in Administration/Managed Care, and a Post Masters degree in Informatics (Health Information Technology), both from the University of Maryland. Over the years she has held numerous positions at Bon Secours Health Systems, including Director of Perioperative Services. She currently serves as Corporate Director of Clinical Resource Management, where she leads the development, communication, and promotion of cost-saving opportunities and process improvement of clinical-related supplies and services for the system's 14-plus acute and long-term care facilities in six states. Affiliated with several professional organizations and a published contributor to industry journals, she is also a member of the editorial board of the *Value Analysis Newsletter*. In addition, she is Six Sigma Certified as a green belt.

### Q: What drew you to the healthcare field?

A: I was always good in science. Plus there was this medical show on TV, one scene in particular, where a nurse in the OR was slapping an instrument in the doctor's hand. I thought, "That's for me." I located a local college that offered certification courses for OR techs, found it thrilling, learned everything I could and, as reward, was sent to Johns Hopkins for my clinical practicum.

### Q: How did you transition to Value Analysis?

A: When I joined Bon Secours, OR nurses were responsible for the service line par levels and stocking, ordering, rotating, and working with vendors. As I was promoted, it became part of my overall responsibility. I was becoming more interested in administration. So when my current position opened up, it seemed like a natural transition.

### Q: How did you prepare for your current job?

A: It was an evolution: first, my nursing and OR background, then my director and operational experience.

My Masters classes were invaluable, especially the team projects, group research, and presentations. These provided an invaluable education in the dynamics of how groups work.

### Q: How did you get involved with Six Sigma?

A: Bon Secours had adopted Six Sigma in 2000 or thereabouts, with the intent of training all directors and above by 2010. My boss had been trained as a black belt. So when a supply chain issue arose at one of our local facilities, he suggested I take it on as a Six Sigma project. Of course, that meant green belt training for me.

### Q: How can Value Analysis Professionals use Six Sigma in their work area?

A: Any place you have a bottleneck. Six Sigma is a systemized way of thinking. It's process improvement by fact-based evidence, not opinion. You can use it to align your department, improve cycle time, and any number of things.

### Q: How have you used Six Sigma on the job?

A: Here's an example. The goal of my green belt project was to improve contract cycle time. My boss felt that too much time was needed to add and change items to the ordering system. So we formed a team, went through training to learn the Six Sigma process, developed our charter, and went to work. What's interesting is that we *thought* the problem was with the health system office just not processing the orders in a timely manner. What we *found* was the problem was with the form itself. We redesigned the form and developed a set of training materials for the users. As a result, we reduced the amount of time it took to receive supplies based on the improved accuracy of the form being completed.

### Q: What are some of the challenges you've experienced using Six Sigma?

A: First, Six Sigma is time intensive. Green belt training involved full day sessions. Then, the project required two-hour meetings every week for months, plus the completions of individual and group homework assignments as part of the Six Sigma training classes. In addition, we had some nay-sayers who were on the team because their work was affected by the issue we were working on. But once they got involved in the process, their thinking changed. They even apologized! ♦

# Breakthrough BRAINSTORMING

Sometimes, while brainstorming solutions, teams have trouble coming up with fresh ideas. When this happens, management consultant Walter Michalski suggests what he calls the *Double Reversal*, a reversed thinking process to help identify less obvious ideas for problem resolution. In essence, Double Reversal consists of multiple rounds of brainstorming. In the first round, the team lists solutions to the problem at hand. In the second (*reverse!*) the team lists actions that would make the problem worse. In the third (*double reverse!*) the team lists ideas that would correct the “bad” solutions. These ideas are then added to the original – now expanded – list of brainstormed ideas.

**FOR EXAMPLE:** Suppose the project goal is to expedite vendor training. Your prior brainstorming session has come up dry and you want to try *Double Reversal*.

- Step 1:** Review the session objective or improvement goal.
- Step 2:** Display the previous list of ideas.
- Step 3:** State the objective in reverse (in this case, “hinder vendor training”).
- Step 4:** List ideas that will make the original goal worse (ex: “send incorrect paperwork”).
- Step 5:** Double reverse by listing ways to solve those “negative” suggestions (ex: “review paperwork to make sure it is correct before sending”).
- Step 6:** Add new ideas to previous list.

(From *Six Sigma Tool Navigator*)

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\*These healthcare professionals have been compensated by C. R. Bard, Inc. for their time and effort in contributing to this publication.



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