



The Personal Lean Six Sigma Black Belt

by Jay Arthur

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Table of Contents

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Skip Six Sigma Green and Black Belt Training: Educate Yourself	1
So, If You Don't Need To Know Everything, What Do You Need To Know?	2
The Magnificent Seven Tools	2
Principle #1: Focus On the Vital Few, Not the Trivial Many	2
Principle #2: All of the Delay Is In the Arrows	2
Value Stream Mapping (VSM - Tool #1)	2
Reducing Defects, Mistakes and Errors	3
Principle #3: Waste and Rework	3
Spaghetti Diagramming (Tool #2)	3
Performance Charts (Tool #3)	4
Pareto Chart (Tool #4)	4
Cause-Effect Diagram (Tool #5)	5
Countermeasures Matrix(Tool #6)	5
Reducing Deviation (Variability)	6
Histograms (Tool #7)	6
About Jay Arthur	8

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In *The Personal MBA*, Josh Kaufman argues that you don't need an MBA to succeed in business. "You don't need to know everything," he says. "You only need to understand a few critical important concepts that provide most of the value."

I'd like to argue that the same is true of Lean Six Sigma. Joseph Juran often said: "Vital few, trivial many." You only need to know a vital few things to solve most problems. Over the last 25 years, I've used the same seven tools to solve most problems and rarely needed anything else. This leads me to paraphrase Kaufman:

Skip Six Sigma Green and Black Belt Training: Educate Yourself

- Lean Six Sigma Black Belt Training is expensive and time consuming. It costs thousands of dollars and four weeks of your time.
- Black Belt Training covers Ph.D. level understanding of statistics, hypothesis testing, and other methods and tools that you will rarely use *unless you work on a manufacturing factory floor*. Since only one person out of 100 works on a factory floor in the U.S., you are probably one of the other 99 that works in services.
- Black Belt training doesn't differentiate between the vital few and the trivial many; it teaches *everything*. From a *Lean* perspective, this is a form of *overproduction*—teaching too much leads to confusion.
- This graduate level approach to Six Sigma encourages the use of complex, expensive tools that demand more time, money and effort.

"Instead of spending huge sums of money to learn marginally useful information, you can spend your time and resources learning things that actually matter."

Sadly, Six Sigma training isn't very effective. One Six Sigma consultant remarked that one business spent \$4 million with his company but had no bottom line improvement.

So, If You Don't Need To Know Everything, What Do You Need To Know?

You need to know what problems you can solve with Lean Six Sigma. There are three main kinds of problems you can eliminate *directly* with Lean Six Sigma:

- **Delays** *between* steps in a work process
- **Defects** (i.e., mistakes and errors)
- **Deviation** (i.e., variation in the finished product or service)

These are the three silent killers of productivity and profitability. Solving these problems will increase sales, profit margins, customer satisfaction, employee satisfaction and retention in an *indirect* fashion.

The Magnificent Seven Tools

Principle #1: Focus On the Vital Few, Not the Trivial Many

There are two main causes of delay: waiting and unnecessary movement. Usually, a product or service spends too much time waiting between steps in a process. People and materials usually have to move too far, too often, which causes unnecessary movement and delay. Two tools can easily diagnose these issues: *value stream mapping* to eliminate delays and *spaghetti diagramming* to eliminate unnecessary movement.

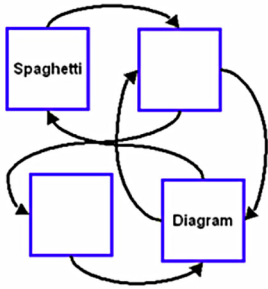
Principle #2: All of the Delay Is In the Arrows



Value Stream Mapping (VSM – Tool #1) uses Post-it® Notes to show the process flow. A small team of people can usually diagram the current workflow in an hour or less. When we start putting times on each of the actions and arrows, members quickly discover that most of the delay is in the arrows. Often, one or two arrows consume most of the total delay. (Vital few, trivial many.)

The 3-57 Rule: After years of examining processes, I have found that people are only working on the product or service for 3 *minutes* out of every hour. The other 57 *minutes* are consumed by delay. Eliminate those 57 minutes and you can *double productivity and boost profit margins by 20% or more.*

Great News: Eliminating delays also prevents defects, mistakes and errors. Not having to pick a product up or put it down eliminates the chances for error. You can't miss a step or duplicate a step if you never put it down.



Spaghetti Diagramming (Tool #2) also uses Post-it notes, but this time to diagram a workspace and show how the product or service, people and materials move around in it. An hour or two analyzing the movement of people and materials in the workspace will identify ways to reduce unnecessary movement by 50% or more. This will also reduce mistakes and errors. It's harder to misplace something when it doesn't have to move too far.

Applying value stream mapping and spaghetti diagramming simplifies and streamlines any work process, accelerating results and eliminating errors. All you need are some Post-it notes, a flip chart and an hour or two with the right people in a room.

Reducing Defects, Mistakes and Errors

Principle #3: Waste and Rework

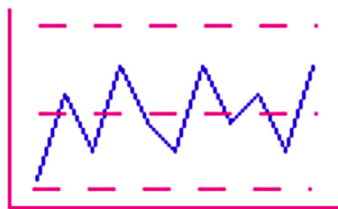
Just one step out of 25 causes over half of the waste and rework. Eliminating delays reduces defects, mistakes and errors by as much as 50%. But you'll need some other tools to eliminate the remaining 50%. To reduce defects, shift your focus from the gaps between steps to the steps themselves. You'll need tools to:

- Count and categorize the types of defects
- Monitor performance over time

Count Your Defects, Mistakes and Errors

Almost every company tracks its defects, mistakes and errors in an Excel spreadsheet. Every row in the spreadsheet identifies the what, where, when, how and why of the defect, but few people know how to summarize this data using pivot tables to count and categorize the defects. This is the secret to finding the *invisible* low hanging fruit in any business.

Once the defects have been summarized with pivot tables, most people use simple line or column charts to monitor business performance. Unfortunately, these charts can't tell you the first thing about whether the process is performing consistently and predictably or not. To analyze performance use a performance chart (a.k.a., control chart). These charts have been around for almost 100 years, but were hard to create and were found mainly in manufacturing plants. Now they are easy to create in Excel using the [QI Macros](#).



Performance Chart

Performance Charts (Tool #3) analyze variability in the data and figure out what conditions constitute statistically unlikely ones. By definition, these conditions should only happen 3 times out of 1,000 (0.3%); so if they show up within 20-30 data points, it's unlikely that they are part of a predictable process. The goal is to use performance charts to measure,

monitor and improve the process to make it stable if it isn't already. [QI Macros](#) can create these charts for you easily and identify unstable, out-of-control conditions.

Processes are either stable and predictable, or unstable and unpredictable. When a process is unpredictable, use *root cause analysis* to find out why it's unpredictable and implement changes to bring it back to stable, predictable performance.

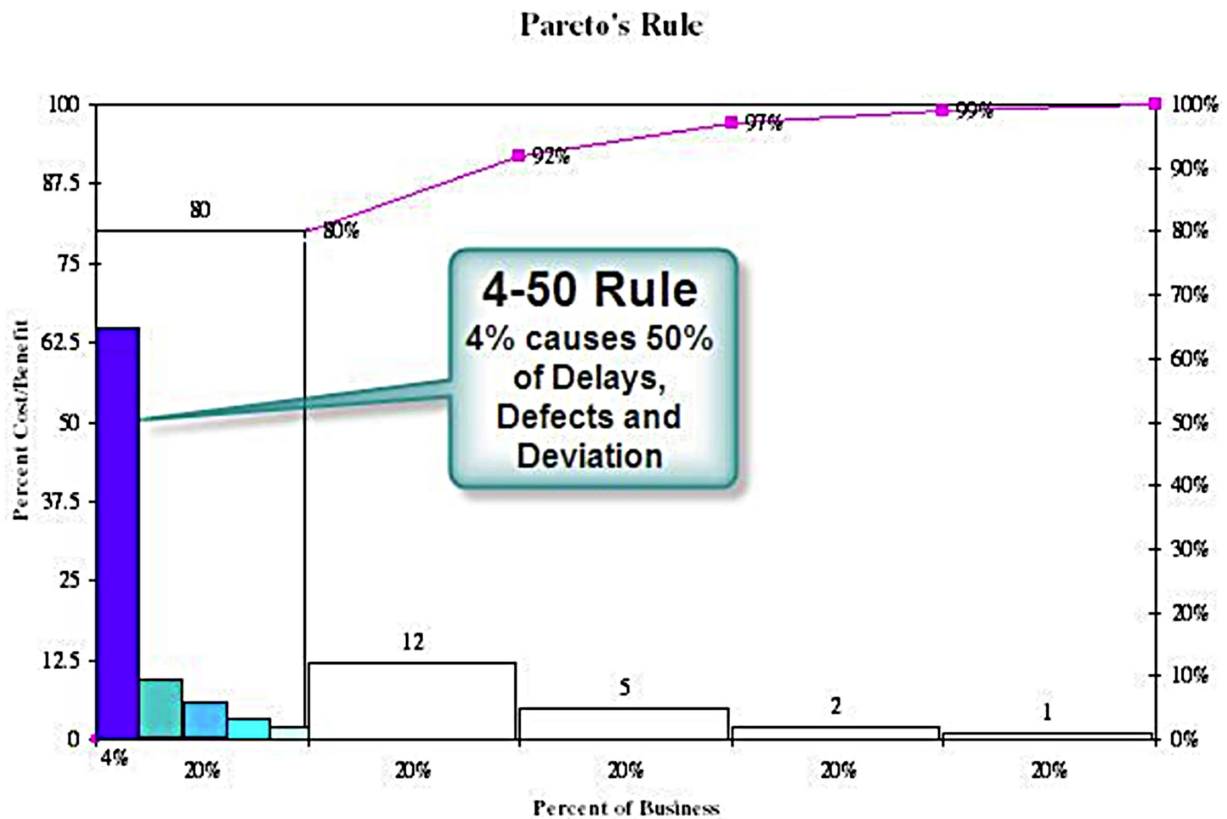
Once you start improving your processes, use performance charts to *monitor* the process, because defects, mistakes and errors will happen so *infrequently* that you won't be able to detect an increasing error rate with your five senses. The only way to detect unstable conditions will be with a performance chart.

Categorize Your Defects, Mistakes and Errors

Pareto Chart (Tool #4): Once you've determined your error rate, categorize the types and costs of defects. Fix the worst first. The Pareto chart turns Pareto's 80/20 rule into a vivid chart that laser-focuses improvements.

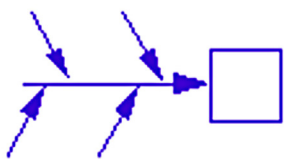
A Pareto chart sorts the errors in descending order. The left-most bar shows the worst of the worst. (Vital few, trivial many.) It also shows how much each bar contributes to the total problem. Sometimes, we have to dive deeper into the first bar to see if there's a Pareto within it.

The 4-50 Rule: Four percent of any business causes over 50 percent of the mistakes, errors, defects, waste, rework and lost profit. That's just one step out of 25.



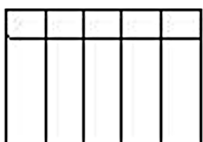
Tar pit: Trying to solve more than one problem (bar) at a time.

Tar pit: Not drilling down far enough. Narrow your focus to maximize results.



Cause-Effect Diagram

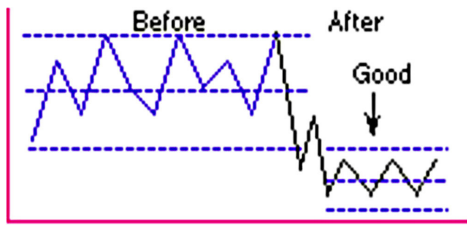
Cause-Effect Diagram (Tool #5): Once you've determined the most frequent or most costly type of error, convene a team of experts to figure out the root cause (Tool #5) of the defect, mistake or error. When laser-focused on just the "big bar," teams can usually find the root cause in an hour or two and determine how to prevent it.



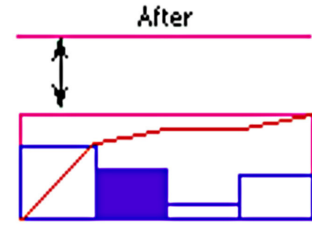
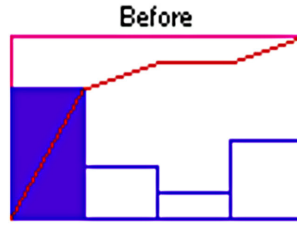
Countermeasures

Countermeasures Matrix (Tool #6): Use this tool to layout the possible solutions to prevent the defect. This is known as mistake-proofing.

After implementation, it's simply a matter of validating that the change created the desired effect. Did it reduce the error rate? Did it reduce or eliminate the "big bar" on the Pareto?



Comparing Performance Charts



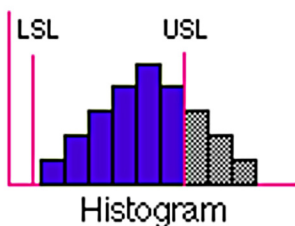
Comparing Pareto Charts

Reducing Deviation (Variability)

Eliminating delays and defects helps eliminate variability in a product or service, but not all of it. I call this variability "deviation" because the product or service deviates from the customer's expectations. Is the product a little too big or small; fat or thin; dense or porous; long or short? Is your food too hot or cold; spicy or mild? These problems can all be solved easily, but you'll want to evaluate the deviation and monitor it once it's been reduced or eliminated. How stable and predictable is the process? Use a *performance chart* to measure deviation over time and bring the process under control.

Histograms (Tool #7): Is the process capable of meeting customer expectations? Once the process is stable and predictable, use histograms (Tool #7) to determine if the process is capable of meeting customer expectations. Histograms produce "bell-shaped" curves. If the bell fits inside of the customers' specifications, then the process is capable of meeting their needs. The following histogram shows some of the data being above the customers' upper specification limit (USL).

There are two ways to focus this kind of improvement effort:

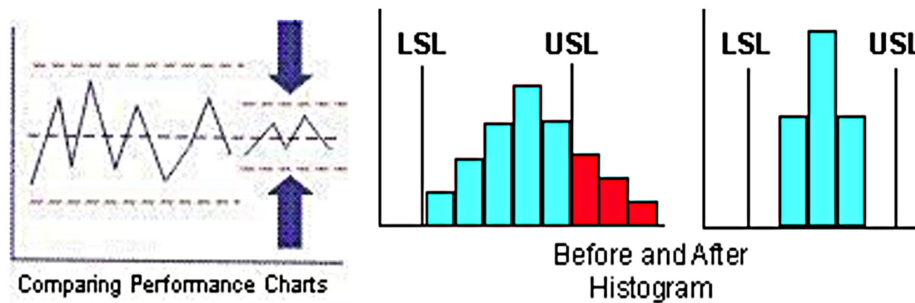


1. Center the data between the upper and lower specification limits (USL/LSL).
2. Reduce the *spread* (i.e., deviation) of data

Simply centering the data can still leave points above and below the specification limits. In this case, you would want to both center the process *and* reduce the spread.

Once you've narrowed the focus using data, you can convene a team of experts to figure out how to reduce or eliminate the spread and off-centeredness. Once the team implements the solution, use a performance chart and histogram to verify and monitor that the process has improved.

In the example below, you can see that the process is now centered on the histogram and the spread has been reduced.



This is all relatively simple if you have the data and tools to chart it. Only a handful of tools are needed to find and prevent fires, thereby saving a ton of money.

You don't need to know everything to start saving time and money; you just need to know how to use the Magnificent Seven Tools of Lean Six Sigma. Every few hours you invest in eliminating delays, defects and defects will return hundreds of hours and thousands of dollars in savings.

Learn how to employ the Magnificent Seven Tools in your business at www.lssyb.com

About Jay Arthur



Jay Arthur, the KnowWare Man, teaches people how to eliminate delay, defects and deviation in one day using Excel and the Magnificent Seven Tools of Lean Six Sigma. Jay is the shortcut to results with Lean Six Sigma.

Jay is first and foremost a Money Belt; he knows how to use data to fix broken processes to save time, save money and save lives. Jay has 25 years of experience helping companies save millions of dollars.

Jay is a frequent speaker at Lean Six Sigma conferences and is the author of many popular Lean Six Sigma books published by McGraw Hill including **Lean Six Sigma Demystified** and **Lean Six Sigma for Hospitals**. He is also the developer of **QI Macros SPC Software for Excel**.