Lean Six Sigma (LSS): A Primer

Sigma: Greek word used in statistics to stand for the amount of variation seen in a process, set of data or anything you can measure[1]

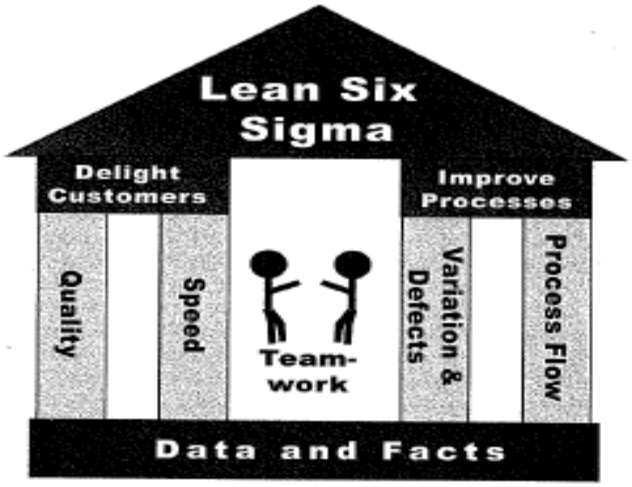
Introduction

The purpose of this primer is to give you an introduction to Lean Six Sigma. Six Sigma is one of the most widely used quality improvement methods available today. Lean Six Sigma is a streamline version of Six Sigma. Lean Six Sigma is an "improvement method" that uses data to identify and eliminate process problems.[1] It is also an improvement "engine" because it's ability to re-design roles, procedures inside an organization so that work generates results continuously. [1]

Even if your organization does not use Lean Six Sigma to it's full extent there is very little downside to getting involved. The kind of training and education offered through Lean Six Sigma enhances your effectiveness no matter what your roll. The upside potential of LSS is enormous. You can get rid of a lot of waste which will save you time and make your work more meaningful and develop decision making, problem solving and teamwork skills while making a difference to your organization. LSS has a proven track record of success in all types of organizations and adapts well to "service" focused systems such as EMS. The California EMS Authority is currently training their quality professionals in this model.

Six Sigma has problems in that it requires extensive education and has fallen into the trap of the number of "belts" trained within an organization as a measure of success. However it does not matter how many Six Sigma "green or black belts" you have in an organization if they cannot find and fix the long response times, treatment errors, customer dissatisfaction, time and financial waste. LSS uses a handful of tools that can solve about 90% of the problems and is focused on what works. LSS is focused on reducing delay and non-value-added activities. It uses essential Six Sigma tools for reducing defects and variations. The application of the 4-50 rule and a handful of tools make the difference. "Lean Six Sigma is a journey, not a destination." [2]

Figure 1.1:The Keys to Lean Six Sigma



Source: *George, M., Rowlands, D., Kastle,B., "What is Lean Six Sigma?", McGraw-Hill. 2004*

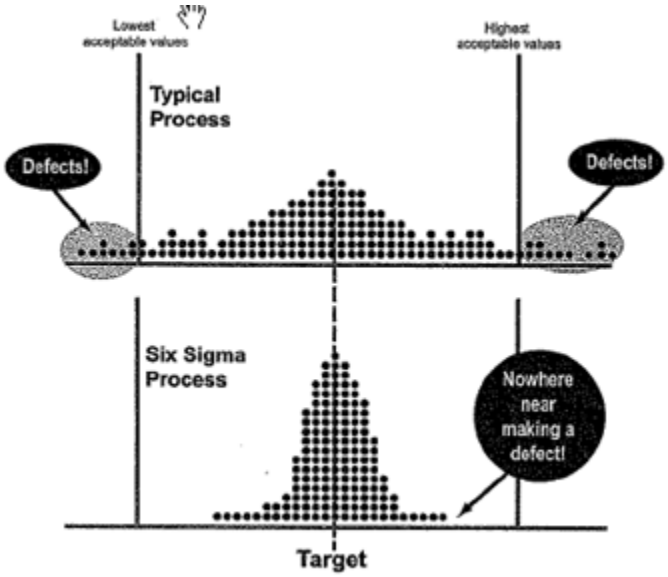
"It takes all the elements, working together, to create real solutions. Any of the elements alone are not enough. You need to combine the creativity of people working on the process with data and with an understanding of customers and processes."[1]

Top 10 Ways You Know You Need Lean Six Sigma[2]

1. Customers still complain about your services
2. Employees complain about roadblocks to serving patients
3. Blaming customers
4. Blaming employees
5. Customers become frequent flyers or use system inappropriately
6. Costs climb
7. Customers switch to your competitors
8. Productivity flat lines or falls
9. Margins thin
10. Growth Stagnates or shrinks

What is variation and why is it important? [1]

Variation is one of the most common sources of problems in a process. There are lots of process improvement methods but most serve the two purposes. One of those is to eliminate variation in quality and speed. In every action there is variation. What is important is to look at the "way" something varies. These patterns in the variation can expose the cause of problems and point the way to solutions. Explore how each task is completed and how long that task takes. Is the task done in the same way all the time? Is there any easier way to do the task more quickly? What gets in the way of people being able to do the task the way it is supposed to be done?



Variation Graph-Source: George, M., Rowlands, D., Kastle,B., "What is Lean Six Sigma?", McGraw-Hill. 2004

Lean Six Sigma Pearls [1,2]

- 4% of the methods and tools will give you over half of the benefit.
- LSS is a toolkit for helping you think "outside the box"
- Unnecessary complexity adds cost, time and enormous waste.
- Teamwork is essential. Work towards having an environment where people are encouraged to work together every day. People can discuss and resolve problems openly and don't use issues against each other. There is a feeling that we are all in this together.
- Anything that does not meet the customer needs is a "defect"
- It is easy to make improvements in a bad process but very difficult to improve a process that is already working fairly well
- Is result oriented, project-focused approach to quality, productivity and profitability
- Defines customers broadly as both internal and external to the organization or system
- Internal processes can leak cash like a rusty bucket
- It is important to blame processes and not people
- Errors are not your fault or the fault of your people. It's your systems and processes that are at fault; they let people make mistakes that could be prevented.
- Delays between the steps in your processes cost you time and money and dampen your productivity and profitability
- Watch your product or service, not your people: Time taken to fix defects, mistakes and errors that shouldn't have happened in the first place consumes time and money that could be better spent serving customers.
- Watch your process, not your people. Control variation, the small and large differences from day to day month to month of your services. Even a small

reduction in delay, defects and variation in your process can give you a substantial improvement.

- In addition to variation as one of the most common sources of problems with a process work flows also are a major source. The hand-offs from one person or workstation to another. The *physical path* that the work follows in the field. One of the best ways to look at this aspect is to draw a map or flowchart of the process. The teams have to examine every step and ask " Is this step necessary? What value does it bring to the customer?"
- Implement a proven improvement system. Most processes are created by accident in an ad hoc way, problems with processes are fixed using common sense and trial and error over time. Eventually these methods do not solve the complex problems organizations and systems face and may stop working all together. A few key LSS tools used in the right sequence can provide immediate breakthrough improvements in speed, quality, productivity and profitability.
- Methods and tools are the easy part: changing the culture is hard.
- LSS will not fix everything about your organization or system. It does not fix customers, poor morale or poor leadership. It is a management system that can improve morale, leadership and services indirectly. It can help you understand and serve your customers better.

The Universal Improvement Method

Regardless of the acronym used for process improvement- TQM, PDCA, CQI, FOCUS, DMAIC etc.- the over-arching method is the same and is it's acronym is FISH for FOCUS, IMPROVE, SUSTAIN AND HONOR. These are the central components of LSS. Organizations that achieve success over time know how to "FISH". It allows for realistic improvement over time.

LSS Process

- **Focus** on key problem areas by counting and categorizing your delays, defects, misses, mistakes, errors and variation. Focus on one key problem, skill or area of your business life at a time. Identify one mission-critical problem to solve. It should be something you can affect directly. "Make the invisible vistable"[14] use data, charts, graphs to help define and measure the issues.
- **Improve** by eliminating delays, defects and variation. Improve significantly in that area. Get started, but start simply, inexpensively. Reduce delay. Most delay happens "between" activities. Count your misses, events, defects and plot them on a line graph. Categorize your misses and display using a pareto chart. Analyze the root causes of these processes or issues and how to prevent them using a fishbone diagram or countermeasures matrix.
- **Sustain** the improvement by monitoring key measures and responding if they become unstable. Sustain improvement through repetition and practice until it becomes an unconscious habit. Measure and monitor to ensure that you sustain the new, higher level of performance. Sustaining change and improvement is one of the most difficult things to do. It is easy to fall back into old patterns. Re-measuring processes at regular intervals helps keeps you informed on how well

you are doing over time. There are many different tools to help you look at data in different ways. Control charts will tell you when something abnormal happens to your process. Reports can be built to help alert you to potentially unstable conditions so you can take action.

- **Honor** your progress with simple rewards. Then review what you've learned and refocus on another area for improvement. Many times we make improvements and forget to honor the progress made. It is important to connect pleasure with improvement. Develop a system of rewards and recognition. Without rewards the quest for improvement can be lost. So periodically it is important to look back over the last week, month and year and ask
    - What worked? What have you learned?
    - What have you accomplished?
    - How have you grown?
    - What's next?

The 4-50 Rule[2]

Pareto's 80/20 rule states that 20% of what you do will produce over 80% of the results. The 4/50 rule is a refinement of this model that states the 4% or what you do will create over 50% of your results. This is where you should spend your time. You do not have to improve everything, just a few key things that really matter. Two tools that can help narrow your focus are:

- **Voice of the Customer Analysis** to understand the links between what customers want and what you do.

- **Balanced Scorecard** to establish key measures and targets for improvement in four key areas: financial, customer satisfaction, quality and growth.

Skills for Effective Teams [1]

- Set goals
- Assign accountability
- Handle conflict
- Pay attention to how decisions are made
- Make sure you have effective meetings
- Foster continuous learning
- Collaborate with other groups

Base Decisions on Data and Facts [1,2]

Data and facts are the foundation of LSS. Have a rule that people must support their opinions with facts. Facts and data save a lot of trouble and prevent a lot of wasted time and money. Learning to use data to support decisions is challenging. Common roadblocks include a lack of available data, little training in collecting and analyzing data

and historical pattern of using data only to punish or reward individuals, not make decisions about improvement. [1]

Once the decision to use data has been made the next issue is "what kind of data?" Most data falls into two categories:

- **Result measures:** reflect the outcome of a process or procedure
- **Process measures:** reflect what goes on to produce the result

The four typical types of data that teams find useful are[1]

- Customer satisfaction (result measure)
- Financial outcomes (result measure)
- Speed/lead time (result or process measure)
- Quality/defects (result or process measure)

Five laws of Lean Six Sigma[1]

- Customers are important
- Speed, quality and low cost are linked
- You need to eliminate variation, defects and focus on process flow if you want to deliver quality, speed and low cost
- Data is critical to decision-making
- People have to work together to make the kinds of improvements customers will notice

DMAIC (Define-Measure-Analyze-Improve-Control) [1]

DMAIC (pronounced dub-MAY-ick) is the process improvement method used in Six Sigma and Lean Six Sigma for making improvements that last. It forces teams to confirm the nature and extent of problems. Identifies the true causes. Finds solutions that evidence shows are linked to the causes and establishes procedures for maintaining the solutions even after the project is done.

Six Things Managers Must Do to Support Lean Six Sigma [1]

- Pick the right projects
- Pick the right people
- Follow the method
- Clearly define roles and responsibilities
- Communicate, communicate, communicate
- Support education and training