

Lean + Six Sigma

LEAN
ENTERPRISE



Introduction to Lean and Six Sigma

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Course Agenda

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- What is Lean?
- Introduction to Six Sigma
- Key Principles of Lean
- Summary & Conclusions



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Who am I?

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A Baseline for Improvement "First Data" Video

Old (unimproved process):

<http://www.youtube.com/watch?v=BNjzaWUZ4yg>

After You watch the Movie:

Let's discuss the Wasteful Activities that occurred.
Where did we see activities that the end customer might not see as valuable?

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A Baseline for Improvement "First Data" Video

Improved Process:

<http://www.youtube.com/watch?v=j4AyLkRWyUY>

Let's see how your ideas for improving this process compare to how the process was actually improved.

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What is Lean and Six Sigma?

First,
Lets Break Down these Two Methodologies...

“Lean (Enterprise)”
and
“Six Sigma”

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What is LEAN?

Lean thinking considers the life cycle of materials, products, transactions and information

The goal is to minimize work and all non-value adding activities to increase value and reduce opportunities for defects and errors

Customer satisfaction increases and production costs decrease

“We cannot solve our problems with the same thinking we used when we created them”

--- Albert Einstein

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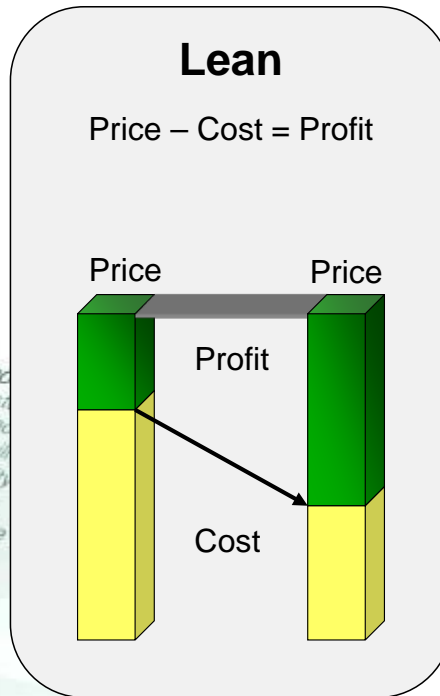
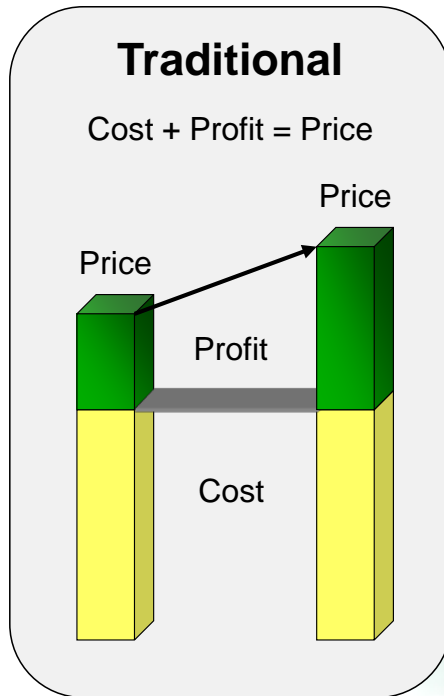
What are the Goals for Lean Implementation?

- Eliminate Waste (or in Japanese “Muda”)
- Significantly Shorten Cycle Times
- Improve Quality
- Reduce Operating Cost
- Manage Inventory Effectively

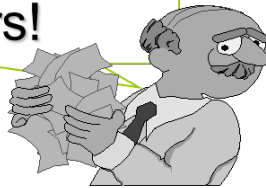
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Lean and Reduction of "Cost"...

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We Made the Numbers!



But at What Cost?



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The Goal of Lean is to Eliminate Waste (Muda)!

What does a Process that exists without Waste look like?

- Product or service produced 100% to customer demand
- Immediate response to the customer's need
- Zero defects
- Zero inventory
- Instant delivery to the customer

Hint: This process does not exist

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Lean and Cycle Time ...

Long cycle times are a direct result of processes that contain significant waste (or better termed as "complexity")

Waste grows exponentially as each step that contains waste turn into a System

Our experience shows that 95% of a Process only adds Value to the Internal Business!

The Goal of Lean is to Reduce Complexity
therefore Reducing Cycle Time

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Lean and Quality ...

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If I have a 100 step process and through following the Lean Concepts I determine that 95% of those steps are “Non Value Added” and reduce the Process to 10 Steps (You will never completely rid a process of Non Value Add), how have I potentially affected the process positively?

How have I affected the Quality of the Process?

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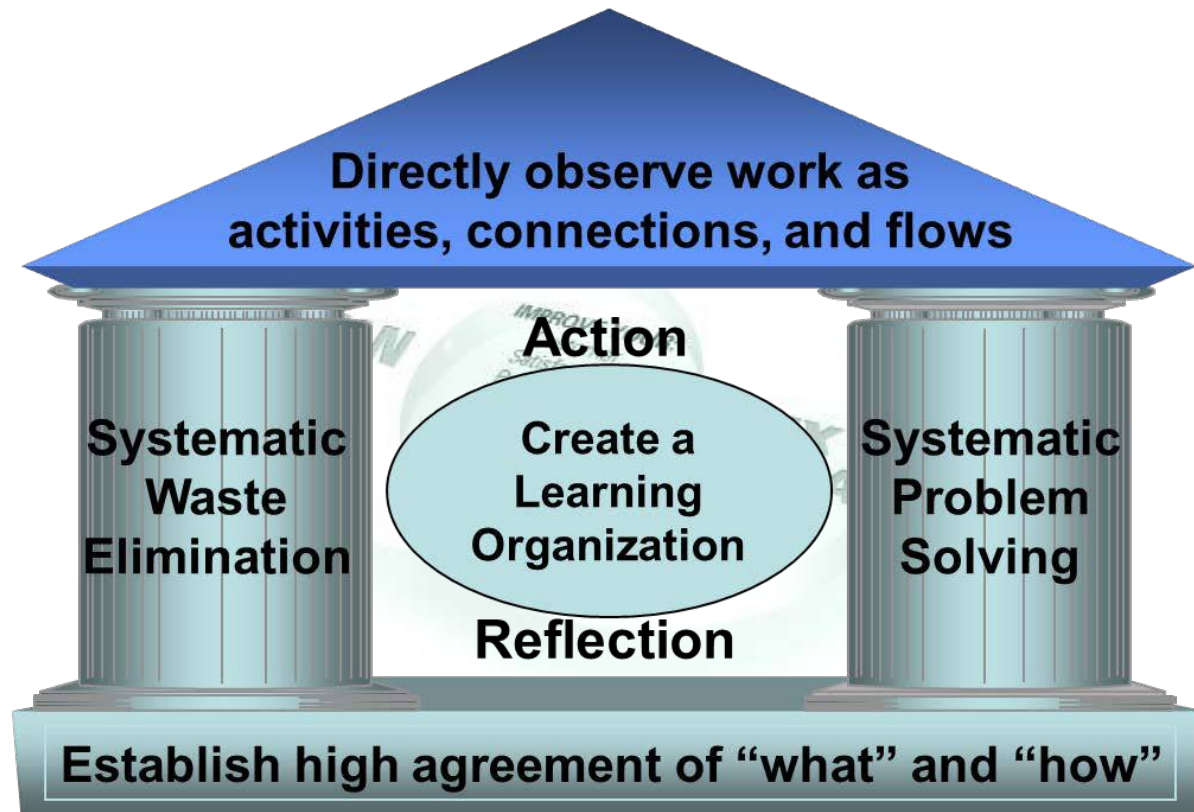
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Building the “House of Lean” Starting with the Foundation ...

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Flinchbaugh and Carlino,
The Hitchhiker’s Guide to Lean

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What is "Six Sigma"?

"SIGMA"



Sigma is the Greek Letter used by Statisticians to denote the Standard Deviation for a set of Data.

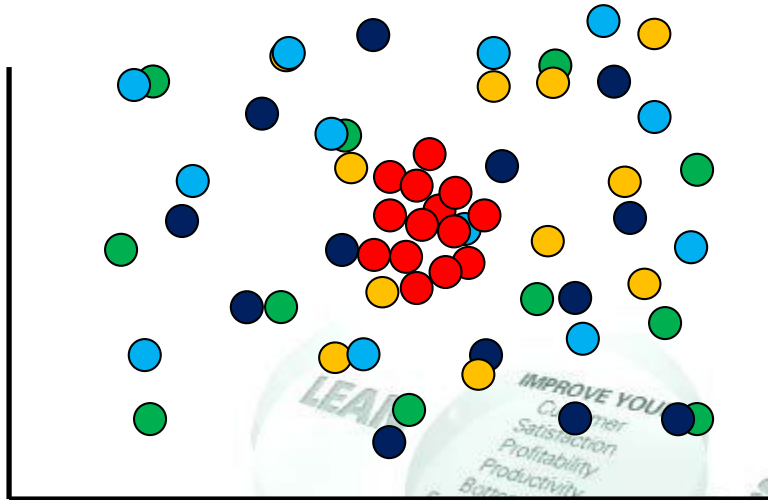
The Standard Deviation provides an estimate of the Variation in a set of measured data.

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Six Sigma and "The Kicking Coach"

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Who are you going to Pick
for Saturday's Game?

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What is? SIX SIGMA

~~VARIATION~~

Common Cause Variation (Noise)

The Random variation that occurs in every process every day

Not Easy to Eliminate

Special Cause (Assignable) Variation

Easy to Eliminate

Due to a Specific Cause (Outliers in the Data) that we can Isolate

"Variation is our Enemy!!"

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What is?

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Can an organization have a process that performs quickly, but does not produce a quality product, part, or service?

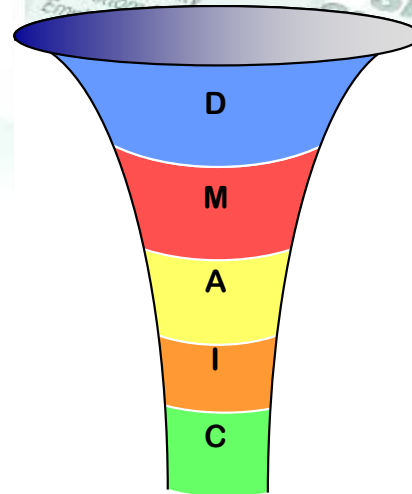
Can an organization have a process produces the quality that customer requires, but cannot meet demand because of slow cycle times?



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The Lean Six Sigma Structure ...

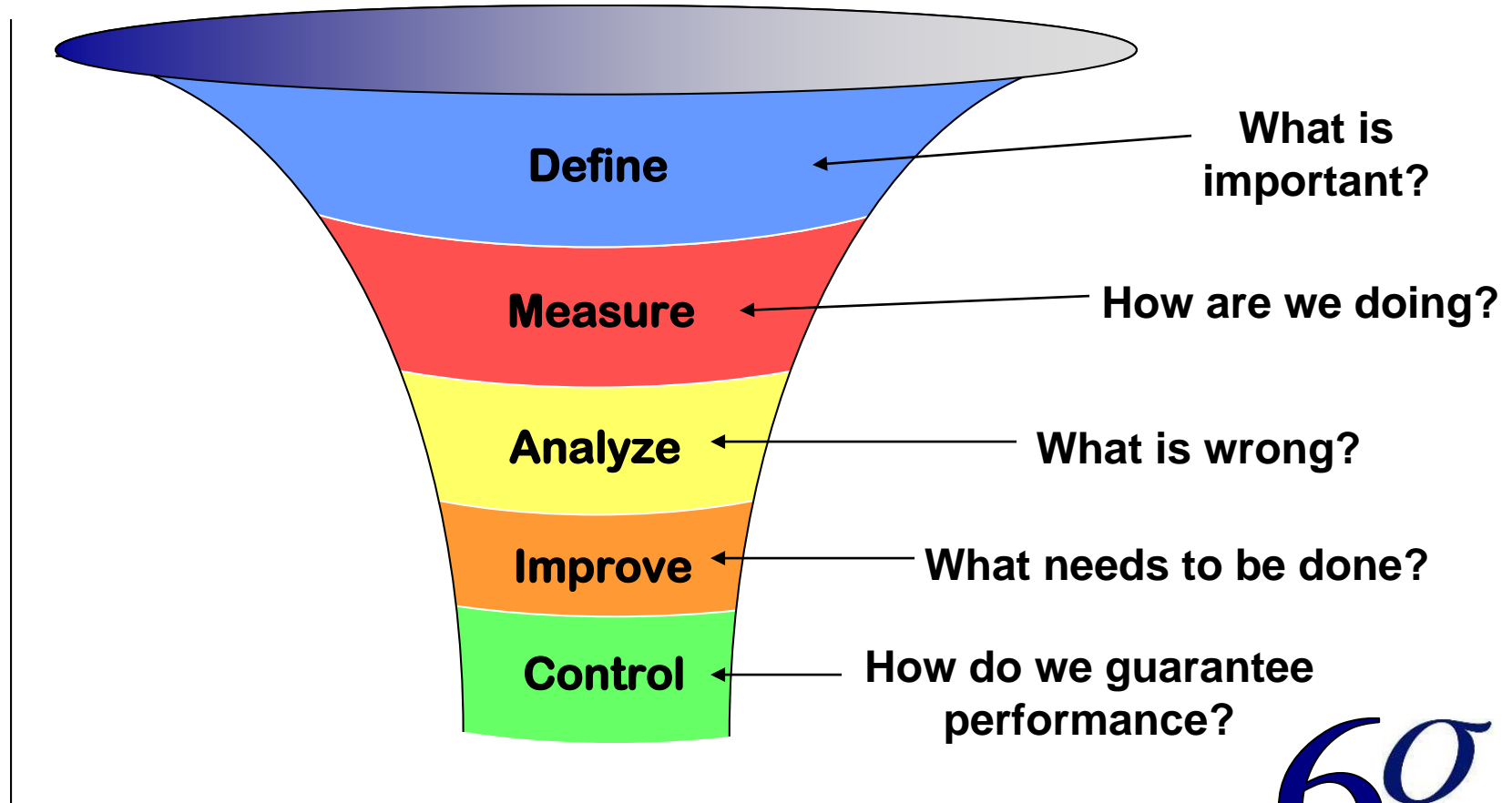
- DMAIC is an acronym for five interconnected phases: **D**efine, **M**easure, **A**nalyze, **I**mprove, and **C**ontrol
- As the problem progresses through the various phases, the sources of the waste and/or variation are determined
- The phases act like a funnel, taking many sources to a critical few



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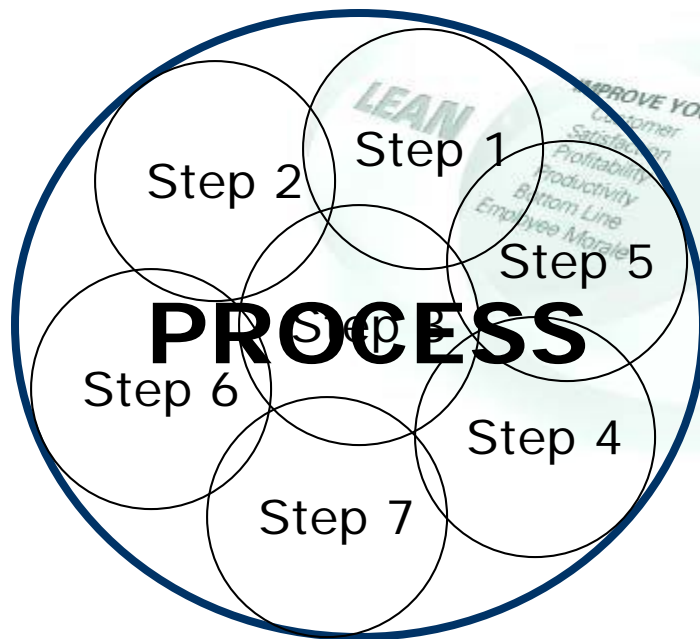
The DMAIC funnel

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Lean and Six Sigma "Systems Thinking"



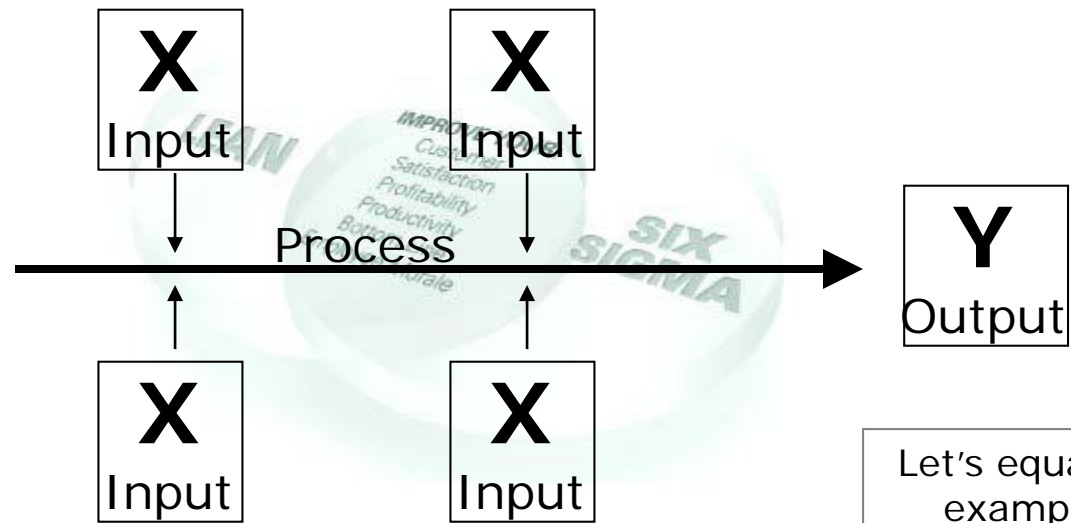
To be successful in any Process Improvement endeavor ... you must first learn to see the "Systemic View" of a process.

Start to see a process as a sum of its parts and not as a whole.

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Systems Thinking...

(X's (Inputs) and Y's (Outputs))



Let's equate this to a
example in your
environment...

$$\text{Equation } Y=f(X1, X2, X3...Xn)$$

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The 7+1 Wastes (Muda's?)

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**“Waste is our
Enemy!!”**

Overproduction and Early production

Waiting

Transportation

Inventory

Motion

Over-processing

Defective units (can lead to Rework)

Underutilization of Talent

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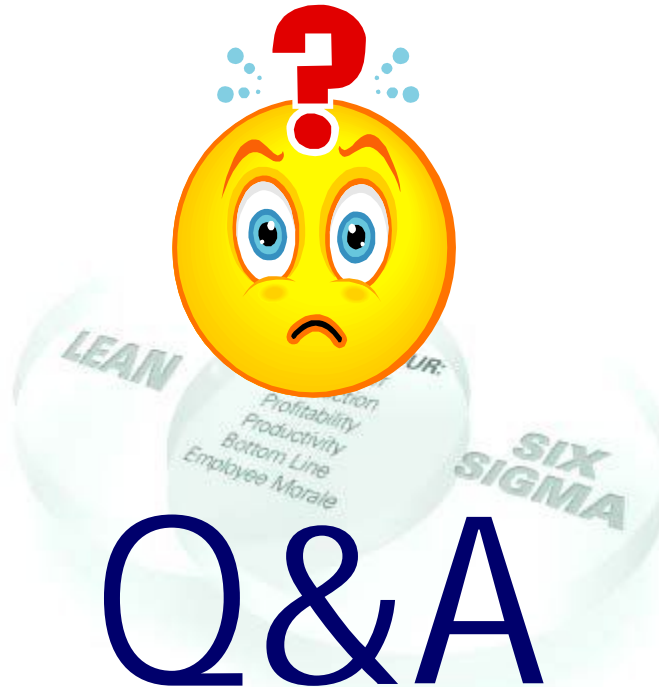
How well do you See? "Lean Alertness Test" Video



<http://www.youtube.com/watch?v=Ahg6qcgoy4>

How many times does the team in
White Pass the Ball?

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