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Overview of Lean Six Sigma

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Welcome & Introduction

Instructor

- **Chelsea Bridge**
  - Lean Six Sigma (LSS) Master Black Belt
  - Lead PwC's Lean Six Sigma work at NIH
  - Previously supported LSS while working for a DoD client

Agenda

- Why Lean Six Sigma?
- What is Lean?
- What is Six Sigma?
- Lean & Six Sigma
- LSS Improvement Methodology (DMAIC)
- Project/Phase Tools & Activities
- What can LSS be used for?
- Process to Transformational Change
- Questions & Discussion
- Lean Six Sigma Program at NIH

Do any of these look familiar?

Travel

Acquisition Processing

Property Management

Entrance on Duty

Recruiting

Employee exit

Budget Formulation

Conference Planning

Recruitment

Order Tracking

Performance Management

Grants Administration

Employee Awards

Inventory / Material Management

Invoicing

Technology

Freezer Management

Onboarding

… how are they working for you?

Do any of these look familiar?

Entrance on Duty

Recruiting

Employee exit

Recruitment

Performance Management

Employee Awards

Technology

Onboarding

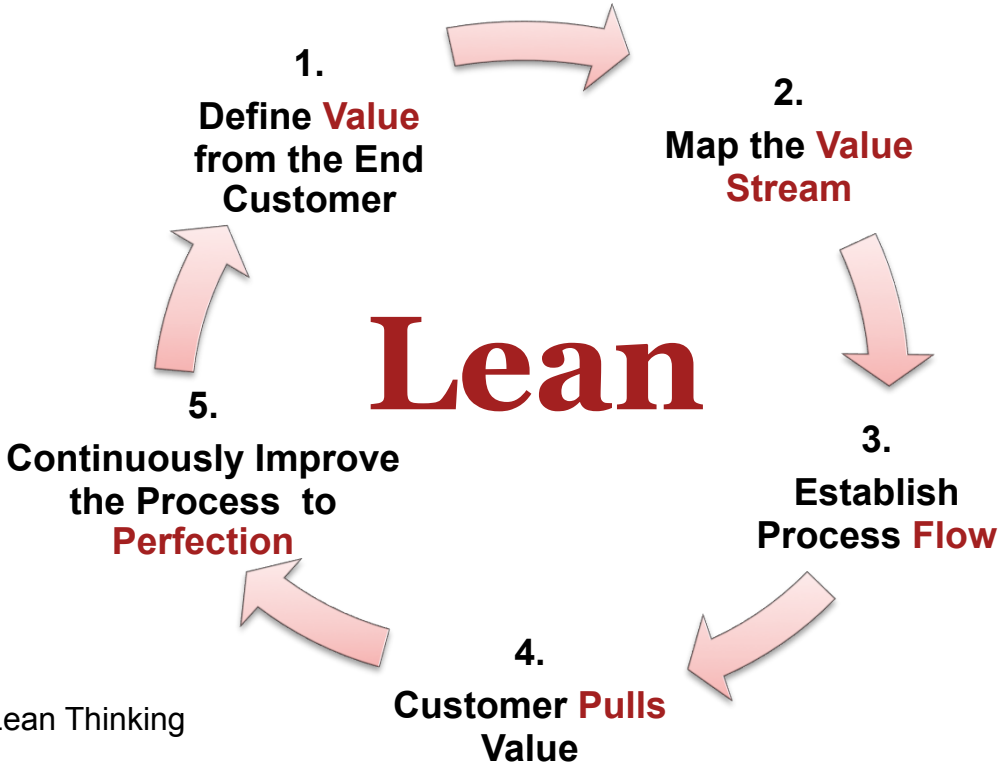
… how are they working for you?

Why Lean Six Sigma?

The Lean Six Sigma methodology helps organizations transform their processes in order to satisfy these customer and organizational requirements.

What is Lean?

Lean is a principle-based management philosophy focused on customer value, planned elimination of all waste, and continuous improvement of productivity and cycle time.



from Womack & Jones, Lean Thinking

The Lean Principle

Much of what we do everyday does not add value to our work.

Value Added	• An activity that changes the "form, fit, or function" of a product or service and creates a feature the stakeholder expects
Non-Value Added - Required	• An activity that does not add value to the process but is necessary in order produce the end product or service for the stakeholder
Non-Value Added	• An activity in a process or service that does not add value to the end product; generally considered as ***waste***

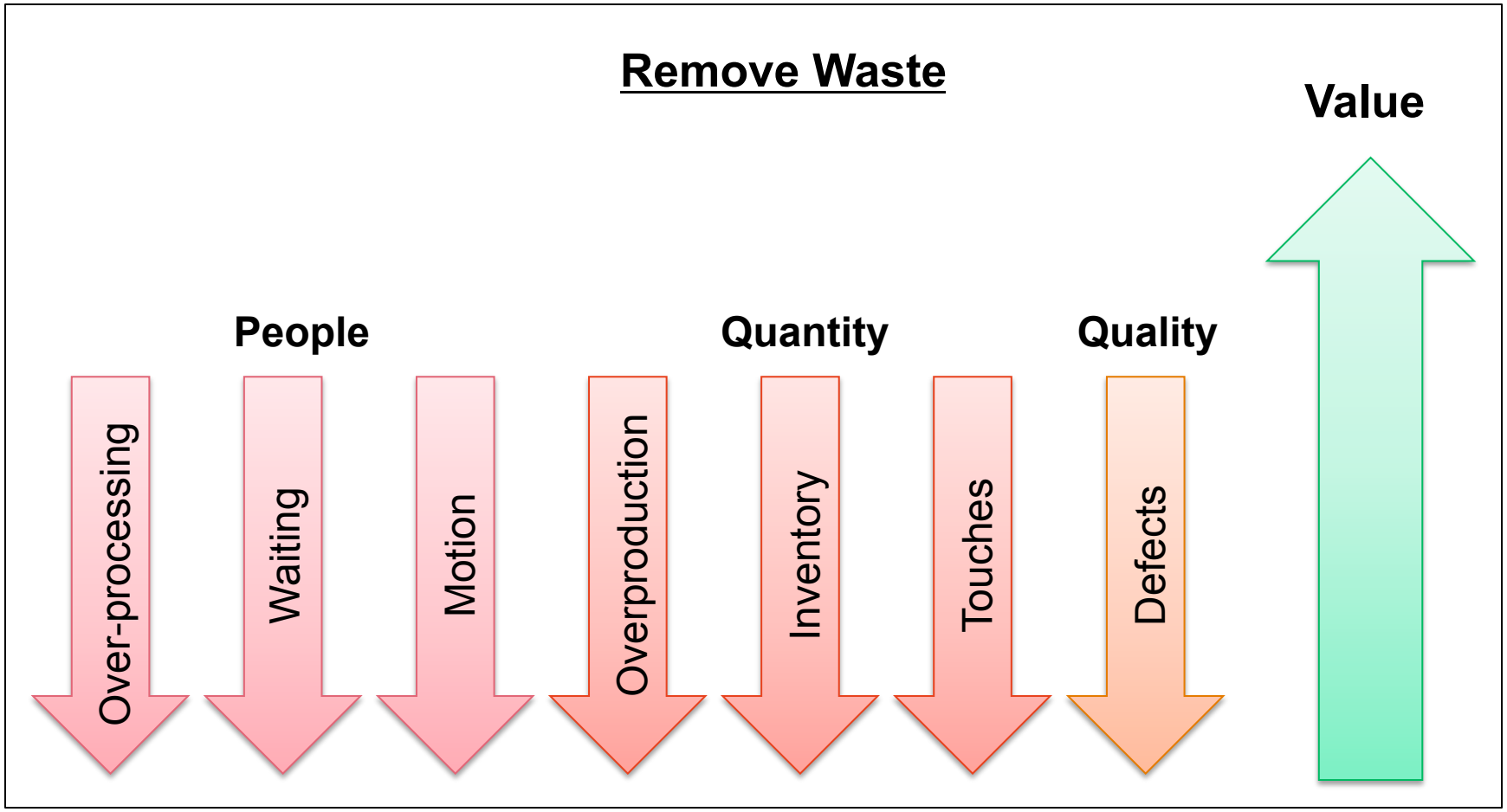
The Concept of Waste

Waste is any activity that does not add value to the product or services to the stakeholder. Lean defines seven types of waste:

1. **Touches** – Every time a product is moved or changed by another person, it stands the risk of being damaged, lost, delayed, etc.
2. **Inventory** – Products sitting somewhere is cash tied up in a material that the customer has not received or bought yet.
3. **Motion** – If workspaces are not clean or organized there can be a lot of unnecessary movement.
4. **Waiting** – Typical symptom of batching and queuing, if people or products are sitting around it is costing the company money.
5. **Overproduction** – Valuable time and energy going into producing parts that either sit around and take up space, or adding embellishments that are not paid for by the customer, resulting in waste of time and resources.
6. **Over-Processing –** Too many approvals, over inspection, and unnecessary complex processes take time and resources away from adding real value.
7. **Defects –** Anytime you have to go back and fix an error it wastes time and money. You can't add value twice!

The Lean Concept of Waste

The goal is to remove **Waste** to increase **Value**.

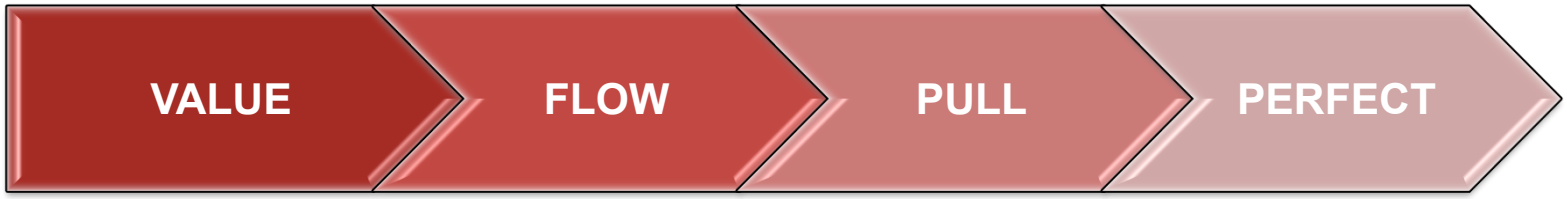


Remember Wastes by asking "Who is TIM WOOD?"

Flow

- The goal is to develop a smooth, even flow:
  - Make the process predictable
  - Eliminate the tendency to “batch and queue”
- Seeks to maximize throughput
- Based upon bottleneck management
- Focuses on the process as a whole not just individual steps
- Even if the process has unbound variables…flow is possible

Transform from Vertical Stovepipe into a Horizontal Flow



- Authoritative
- High Quality
- In Demand

- Interoperable

- Available
- Discoverable

- Applied

Pull

Let the Customers/Stakeholders pull the product or service through the process.

Waiting & Unprocessed Actions Are Waste!

Some waiting is required because of:

- The batching nature of the business
- Normal variation of workflow
- Bottlenecks

Pull Minimizes Inventory/Waiting!

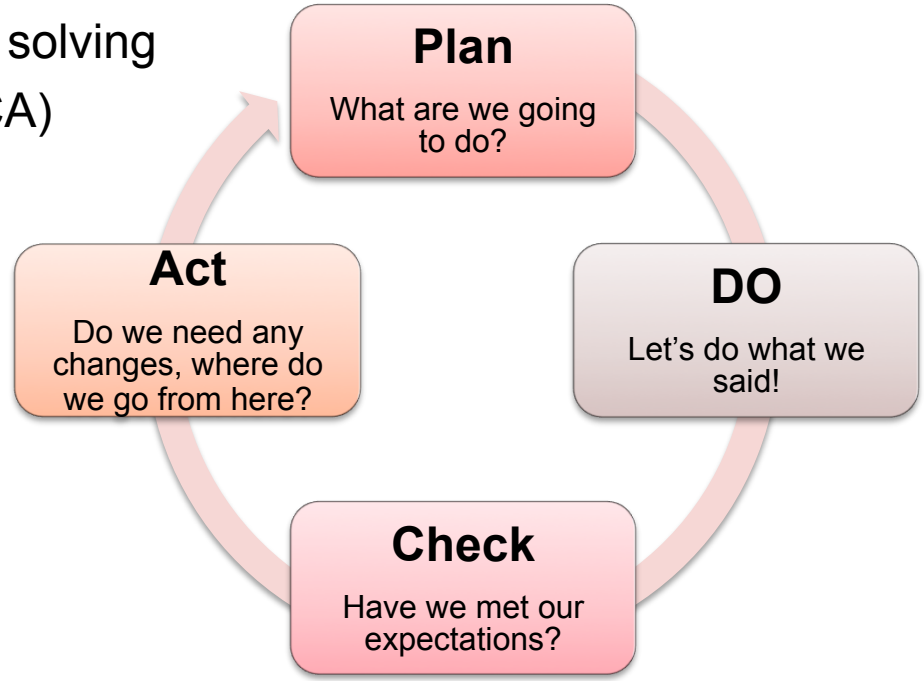
- Pull systems launch major organizational issues that need to be addressed
- Pull systems require coordination
- Pull systems require “perfection”

Perfection

Perfect the process and adopt continuous improvement as a "way of life."

Perfection is possible!

- We must focus on cost effective perfection, using:
  - A scientific approach for problem solving
    - Plan, Do, Check, Act – (PDCA)
  - Kaizen Events
- Supported by Key Performance Indicators (KPI)



What is Six Sigma?

Six Sigma is a management philosophy that targets reducing variation and defects in a process.

Sigma is the Greek letter that is a statistical unit of measurement used to define the standard deviation of a population. As process variation decreases, so does the standard deviation.

A Sigma Level is defined as the number of standard deviations that fit between the process mean and the customer specification limit. As the process "Sigma Level" increases, more process outputs, products, and services meet customer requirements, producing fewer defects.

A true Six Sigma (6σ) process is 99.9997% defect free –

near perfection

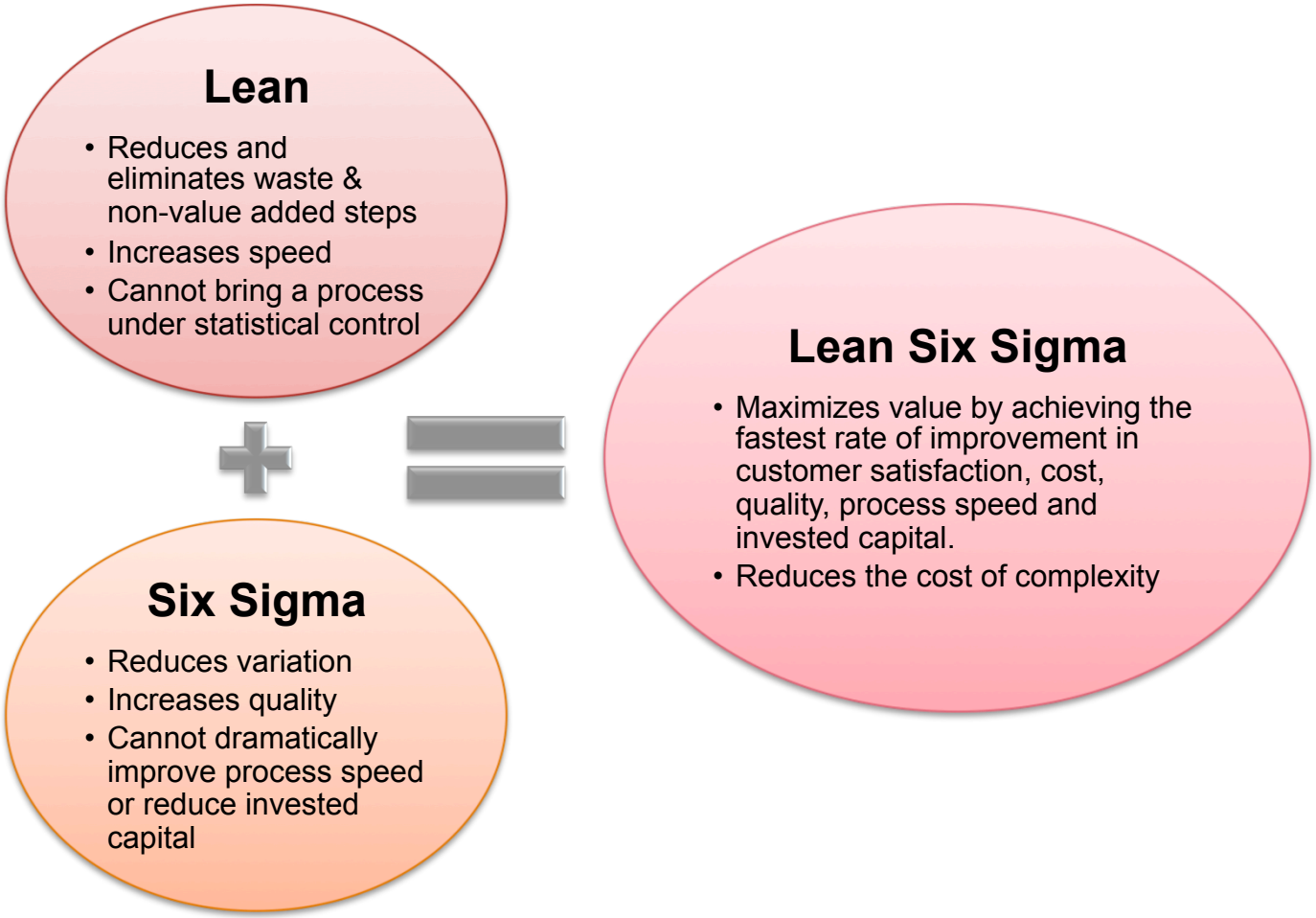
Six Sigma Values

Sigma Value	Spelling	Time	Golf	Yield	DPMO	COPQ
2	7 misspelled words per page in a book	1.35 years per century	Miss 6 putts per round	69.1%	308,000	30-40% of sales
3	1.5 misspelled words per page in a book	3.5 months per century	Miss 1 putt per round	93.3%	66,807	20-30% of sales
4	1 misspelled word per 30 pages in a book	2.5 days per century	Miss 1 putt every nine rounds	99.38%	6,210	15-20% of sales
5	1 misspelled word in a set of encyclopedias	30 minutes per century	Miss 1 putt every 2.33 years	99.977%	233	10-15% of sales
6	1 misspelled word in all the books in a small library	6 seconds per century	Miss 1 putt every 163 years	99.99966%	3.4	<10% of sales

Sigma Value – Relates to customer satisfaction & process performance
Yield – Chance of producing a unit with no defects/errors
DPMO – Defects Per Million Opportunities
COPQ – Cost of Poor Quality

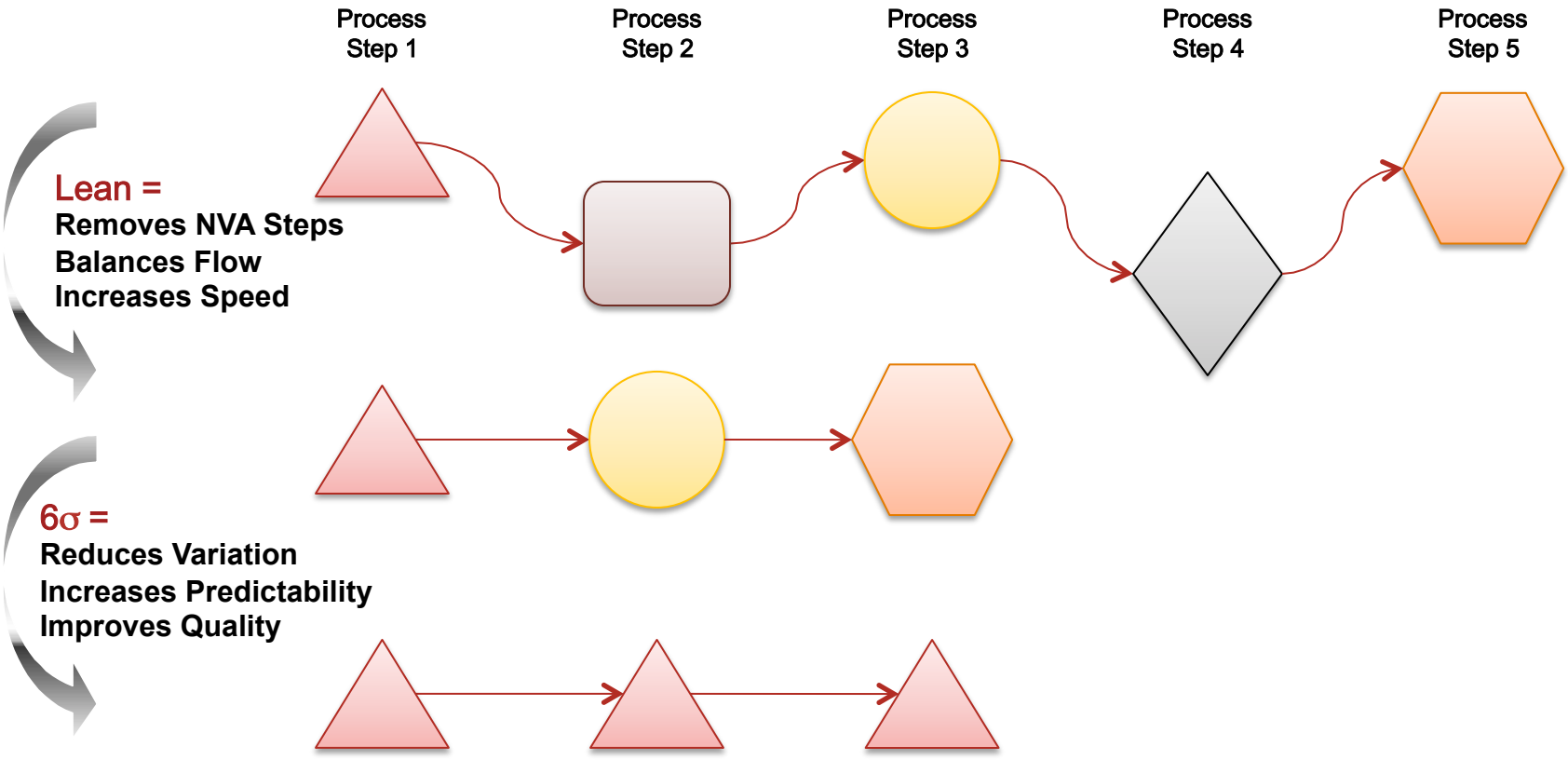
What is Lean Six Sigma?

LSS combines the principles of Lean with Six Sigma to improve process effectiveness and alignment with the voice of the customer (VOC).



Lean & Six Sigma

LSS is a combination of the two process improvement methods. **Lean**, focused on reducing lead time by removing waste and non-value added steps and **Six Sigma,** focused on reducing variability and defects by identifying and controlling its causes. **Employed together, you can increase speed, process capability, and customer satisfaction.**



Lean Six Sigma

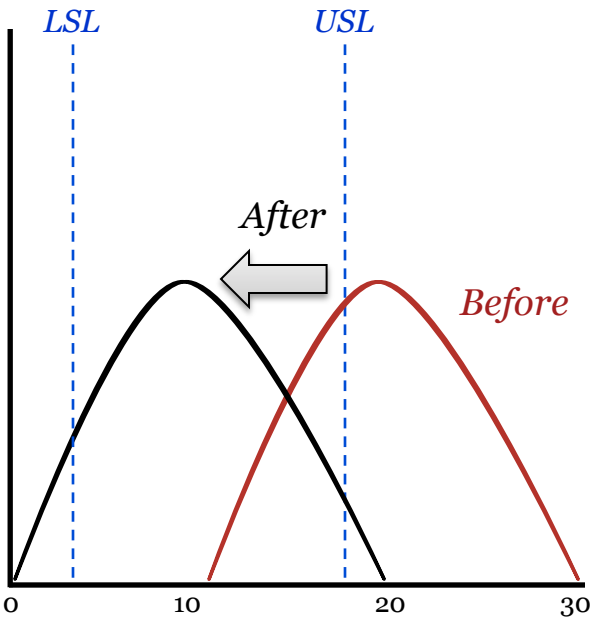
Lean Six Sigma focuses on customer requirements, defect prevention, cycle time reduction, and cost savings.

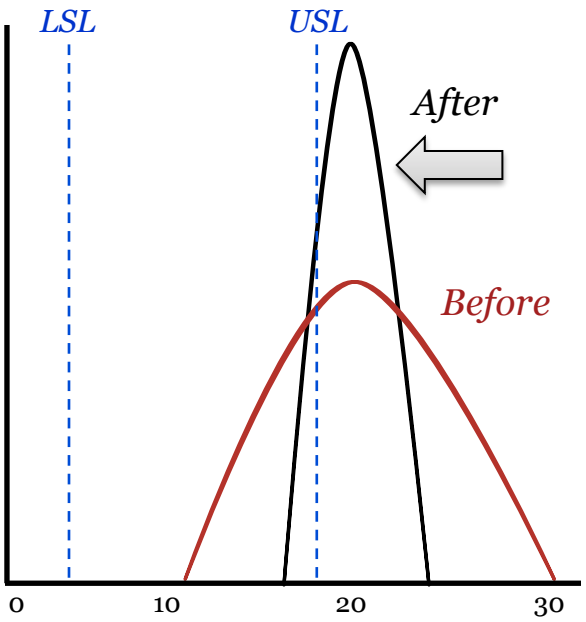
Process Distribution vs. Customer Requirements

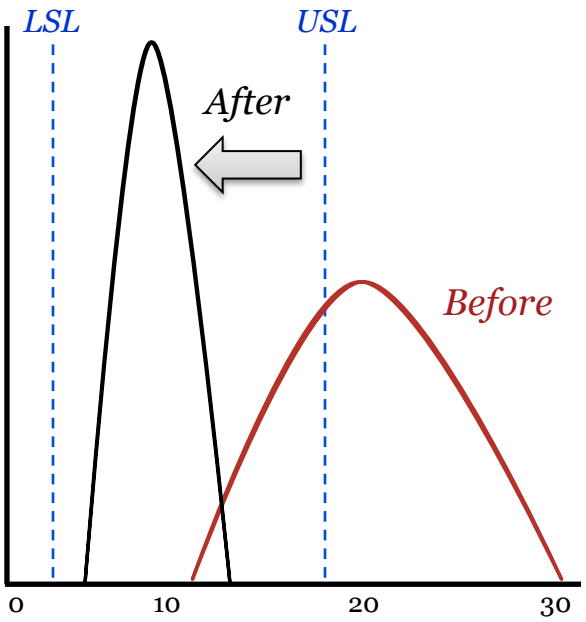
Lean =
Decreases Process Time
Decreases the Mean

6σ =
Reduces Variation/Spread
Reduces Defects

LSS =
Increases Speed & Accuracy
Increases Customer Satisfaction

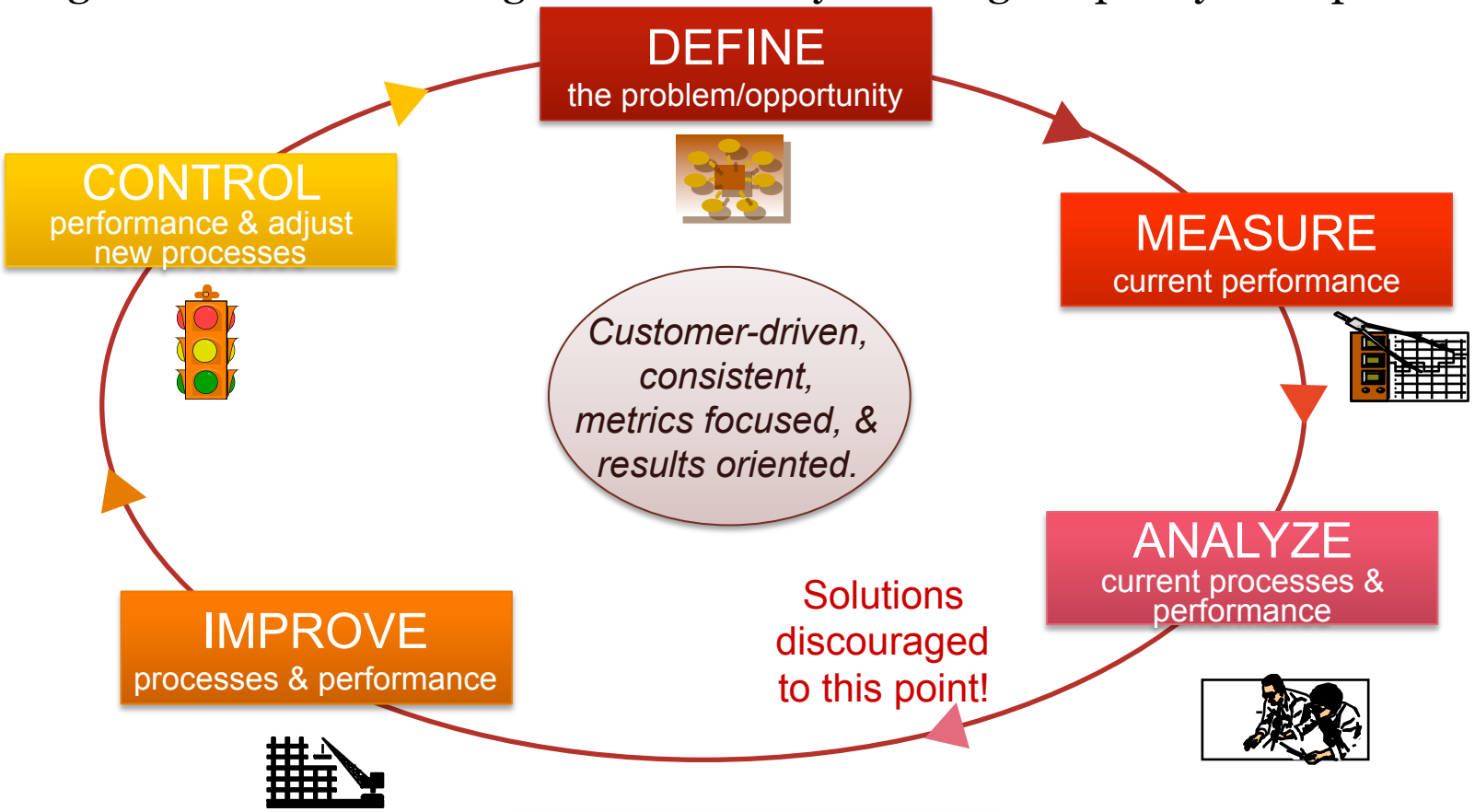






LSS Improvement Methodology

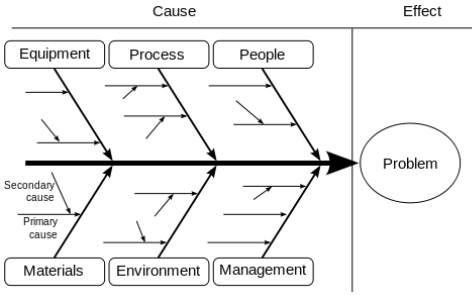
The **DMAIC methodology** is used to incorporate Six Sigma and Lean tools to improve processes by systematically reducing variation and defects, while creating even flow and to delight customers by focusing on quality and speed.

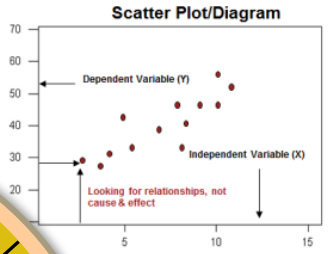


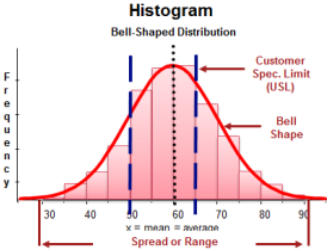
Project/Phase Tools & Activities

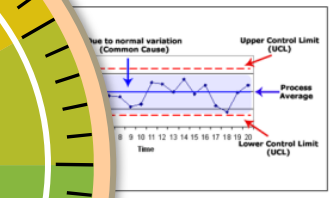
Define	*Measure*	*Analyze*	*Improve*	*Control*
✓ Project Charter ✓ SIPOC Analysis ✓ As-is / Baseline Process Map ✓ Voice of the Customer & Voice of the Business (VOC/VOB) ✓ Stakeholder Analysis	✓ Operational Definitions ✓ Data Collection Plan ✓ Baseline Data ✓ Baseline Statistics	✓ Root Cause Analysis – Fishbone Diagram ✓ Failure Modes and Effect Analysis – FMEA ✓ Prioritized Root Causes	✓ Potential Solutions ✓ Evaluation of Potential Solutions ✓ Prioritized List of Solutions ✓ Quick Wins ✓ To-be Process Map ✓ Financial Benefit Estimate ✓ Goal Achievement	✓ Implementation Plan – RACI Chart ✓ Revised Process Documentation ✓ Process Control Tool ✓ Process Control – Response Plan

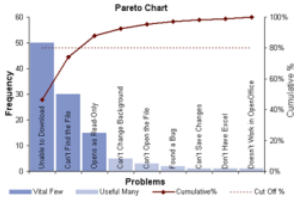
LSS tools and methods are designed to…

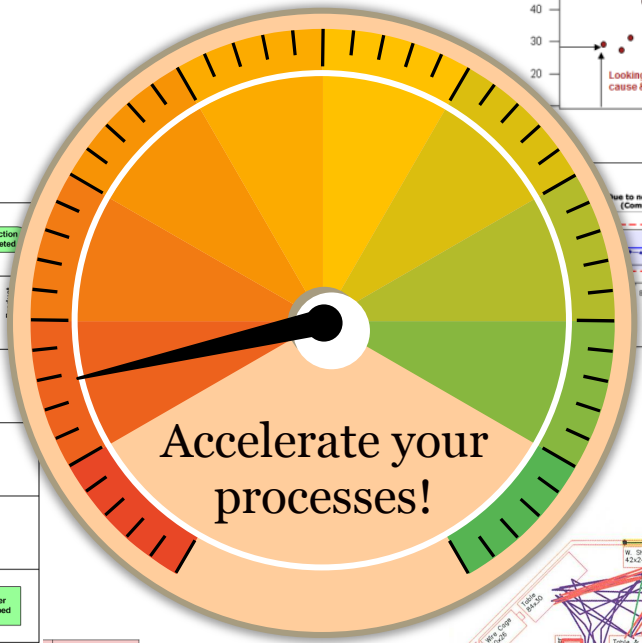


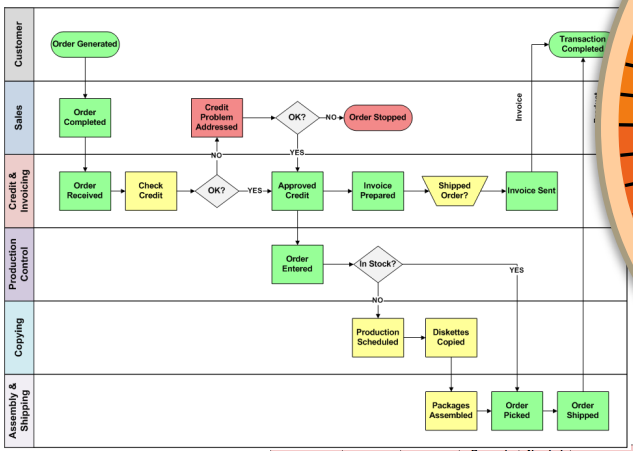


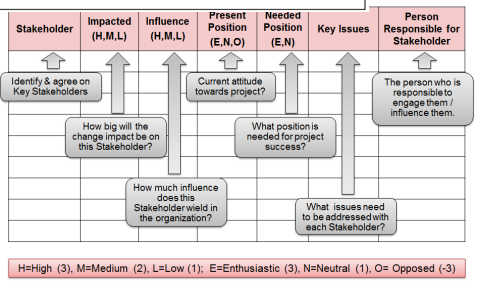


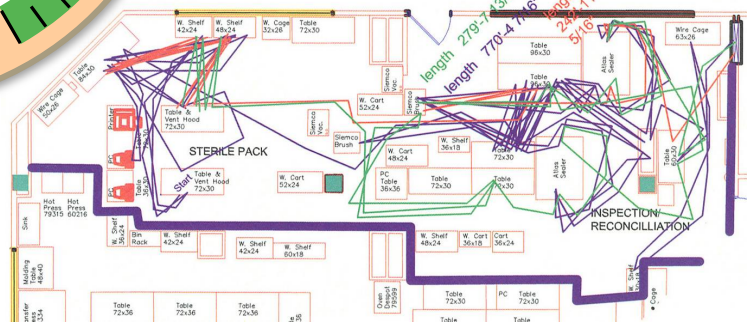






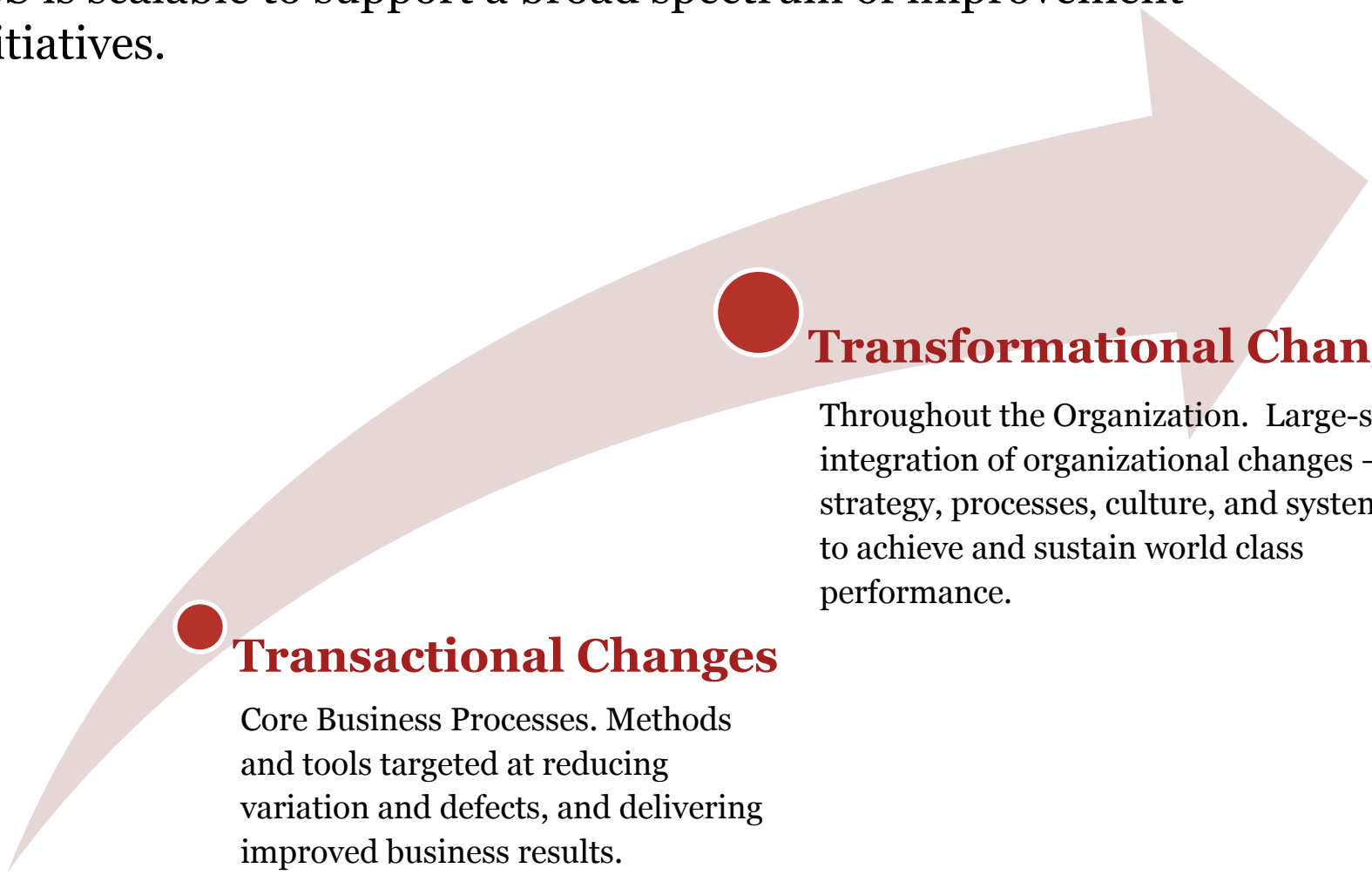






What can LSS be used for?

LSS is scalable to support a broad spectrum of improvement initiatives.



Transformational Changes

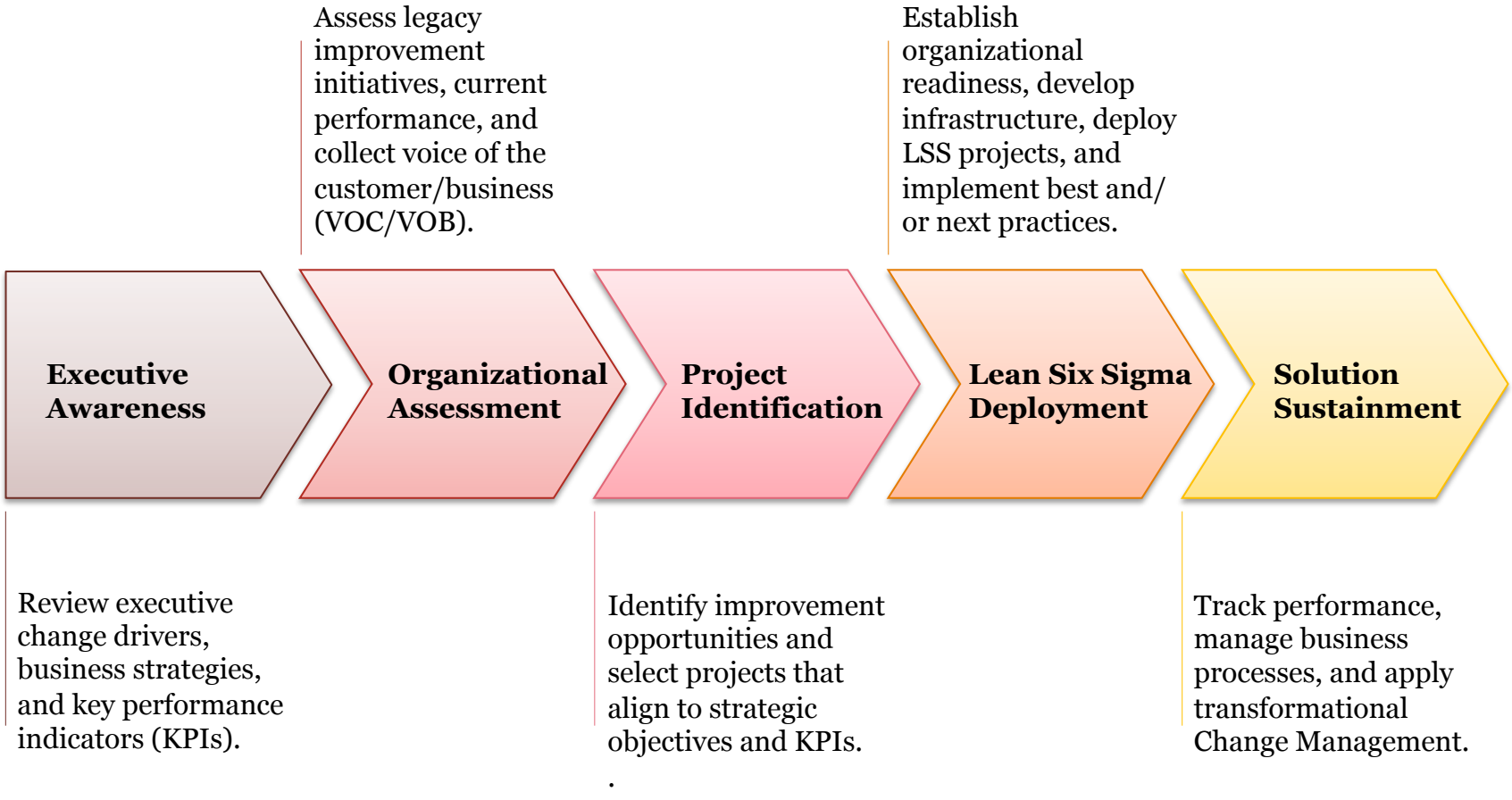
Throughout the Organization. Large-scale integration of organizational changes – strategy, processes, culture, and systems – to achieve and sustain world class performance.

Transactional Changes

Core Business Processes. Methods and tools targeted at reducing variation and defects, and delivering improved business results.

Process to Transformational Change

Strategic LSS Deployment



Questions and Discussion

Lean Six Sigma Program at NIH

Lean Six Sigma Training & Project Mentoring

PwC provides Lean Six Sigma (LSS) Green Belt training and project mentoring across NIH through a contract with the NIH Office of Logistics and Acquisition Operations

- Five-day Green Belt training course developed and conducted as part of the Green Belt certification process.
- One-day Executive Awareness Training for a high level overview of Lean Six Sigma and the DMAIC methodology.
- LSS Green Belt training provided to 231 leaders from 28 Institutes, Centers, and Offices across the NIH.
- 27 NIH employees have been mentored through the OLAO Green Belt certification program, successfully completing 20 improvement projects.
- PwC has improved more than 100 processes across NIH through this program, including at NCI, NICHD, NINDS, NIDDK, CC, NHLBI, NCCAM/NCCIH, and OHR.

28
ICs and Offices attending training

231
People Trained

100+
Processes improved across NIH

Reduced acquisitions redundancy / duplicated purchase efforts

Improved freezer accountability and lifecycle management

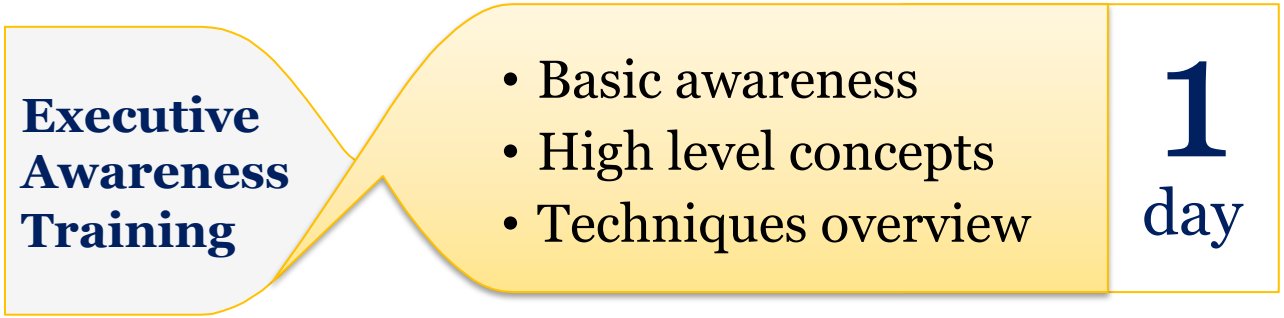
Created a tool that facilitates procurement projections and standardizes reporting

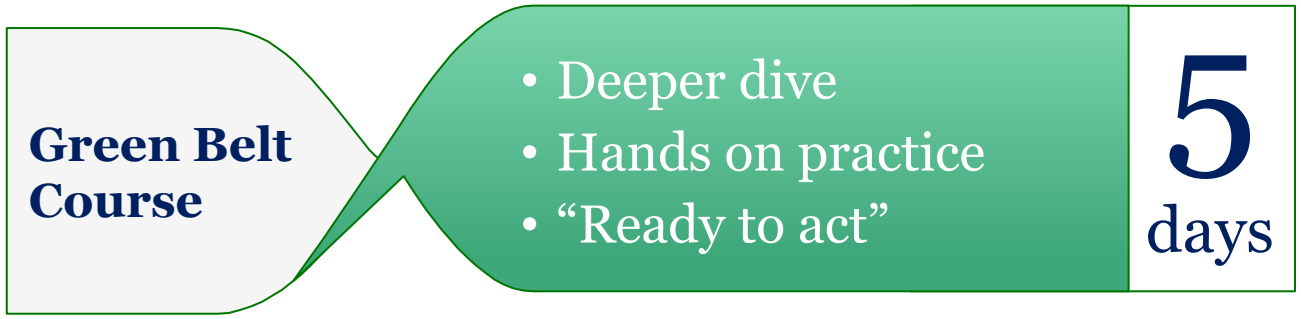
Increased OHR user data awareness by creating a tool that links needs to what reports are available

Improved efficiency and transparency of Onboarding and Exit processes

Courses

PwC offers two dynamic education opportunities for the NIH Community to increase its LSS capabilities.





PwC Human Capital and Talent Management Services

PwC combines government and commercial healthcare experience with in-depth human capital capabilities to help Federal agencies solve their operational and workforce challenges. Our four-phase, integrated approach to talent management provides a full spectrum of services focused on delivering measurable, impactful results.

For more information…

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