Presentation Summary

- White Belt Training
- What is Lean?
- What is Six Sigma?
- What Is Lean Six Sigma
- Case Study
- DMAIC
- Next Steps –Your Project Suggestions

Today Is A Mini White Belt Training

- White Belt training consists is an awareness course offering an introduction to Continuous Process Improvement (CPI) tools and topics, and how you can use these tools in your day-to-day jobs

- CPI White Belt Training will prepare you to:
  - Assist with CPI process improvement projects as a Project Team Member
  - Assist with identification of improvement opportunities in their own offices
  - Recognize five core Define-Measure-Analyze-Improve-Control (DMAIC) Roadmap tools

- CPI White Belt certificates will be given upon completion of the training
  - This training provides **credit hours** for purposes of Federal Acquisition Institute (FAI) certification maintenance
  - **Professional Development Units** (PDUs) may be claimed for those of you with your Project Management Institute, Project Management Professional (PMP) certification

Different Six Sigma Certification Levels

CPI Practitioner Levels	CPI PRACTITIONER REQUIREMENTS
White Belts	- Attend CPI White Belt Training (2-4 hours) - Execute data collection activities - Participate in Voice of the Customer interviews - Work with Level 1, 2, and 3 team members on CPI project work
CPI Level 1 Certified (Traditional Yellow Belts)	- Attend up to 24 hours of training reviewing Hypothesis Based Problem Solving, selected LSS tools, managing team dynamics, leadership, and public speaking - Complete a Just-Do-It, Kaizen Event, or other Rapid-Improvement-Event with a quantitative result; OR - Attend CPI Level 2 OR Level 3 Training
Certified Level 2 CPI Practitioners (Traditional Green Belts)	- Complete a 3-6 month Lean or DMAIC Level 2 Certification Project with quantifiable results; OR - Attend CPI Level 2 OR Level 3 Training
Certified Level 3 CPI Practitioners (Traditional Black Belts)	- Attend CPI Level 3 Training - Lead one Just-do-it, Kaizen, Kaizen Blitz, AND Level 3 Lean or DMAIC Project - Coach and mentor one Level 2 trainee to Certification

What Is Lean

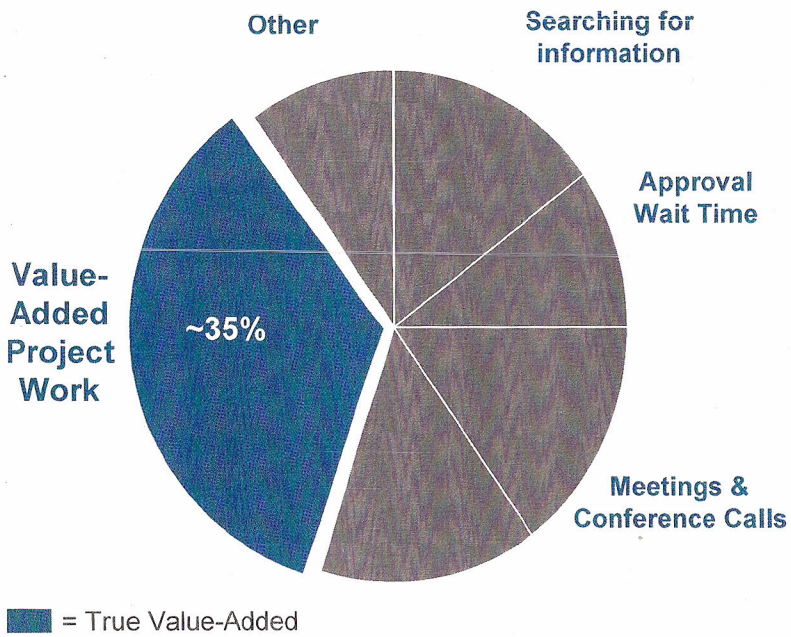
- What Is Lean:
- Focuses on improving speed and efficiency while eliminating waste within business processes
- Targets the "Seven Deadly Wastes" that plague virtually all businesses- -

    excessive motion, waiting time, overproduction, unnecessary processing time, defects, excessive inventory, unnecessary transportation

- Reduces process and business complexity through the use of pull techniques, lean work methods and sourcing/supplier integration
- Reaches beyond visible symptoms (defects, waiting, etc.) to address structural factors and the root causes of waste "

Similar waste can be found in white collar environments, but few organizations use Lean to attack that waste

Typical White Collar Process



Seven Deadly Wastes

Excessive Motion	• Data at different source locations, • Manual signature and approval workflow • Office equipment distance from work areas
Waiting Time	• Waiting for decisions, approvals, meetings, etc. • Functional silos prevent end-to-end process ownership • Inappropriate prioritization of work
Overproduction	• Focusing on details that go unnoticed by customer • Employees not empowered by full process visibility forces need for "rule by committee"
Unnecessary Processing Time	• Policies prevent task completion • Redundant or unnecessary paper work • Transcribing information multiple times
Defects	• Re-work of any kind • Customer requirements that are misunderstood or not communicated well drive downstream rework
Excessive Inventory	• Overstaffing work streams due to lack of understanding of critical path • Minimal understanding of bottlenecks
Unnecessary Transportation	• Multiple unnecessary signatures needed for an approval • Circulating products for unnecessary review

What Is Lean

- A systematic approach to identifying and ***eliminating waste (low value-added activities)*** by setting process ***flow at the pull of the customer*** **in** ***pursuit of perfection***
- Where and When
  - Started with mass production of manufactured items (e.g., Smith & Wesson, Ford Motor Company)
  - Toyoda, Ohno and Hingo developed the Toyota Production System: a disciplined, process-focused system to minimize consumption of resources that add no value to a product
- Lean Principles:
  - Specify value in the eyes of the customer
  - Identify value stream and eliminate waste/variation
  - Make value flow at pull of the customer
  - Involve, Align and Develop Employees
  - Continuously improve knowledge in pursuit of perfection
- ***Lean*...**Focuses on maximizing process *speed*

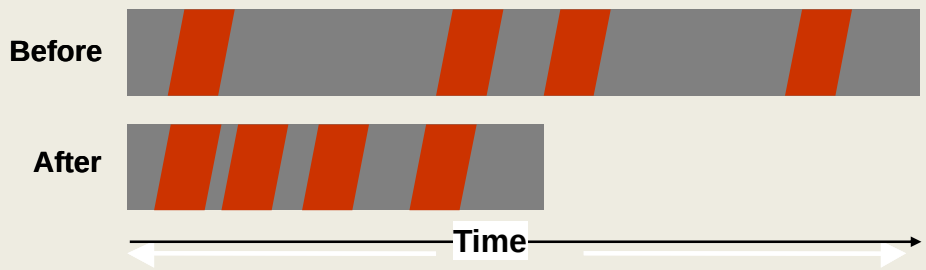
- **When TO use Lean**:
  - ✓ Multiple ***passbacks*** between people or organizations in a process
  - ✓ Process ***workload*** is unknown
  - ✓ Process steps incorporate several ***layers of review*** or "checking"
  - ✓ Engaged in expediting process steps (for reports, purchases, materials, etc)
  - ✓ Do work in ***batches*** (collect certain number of items requiring the same kind of work before embarking on the pertinent tasks)
  - ✓ Process steps are well-known and typically standardized

- **When NOT to use Lean**:
  - ⊖ Not used specifically for process outcome variance or error reduction (although, by removing the waste, many errors simply disappear)
  - ⊖ Not typically used for large scale business reengineering efforts

Using Lean To Determine Customer's Needs

Things that the process end user/customer wants or will wait/pay for → **WORK**

Things that the process end user/customer does not want or is willing to wait/pay for → **Low Value Added**



Value Added Activities/Work (VA)
- **Important to the customer (Pay for it?)**
- **Transformation of information or material**
- **Done right the first time**

Low Value Added Activities (LVA)
- ***Required* LVA (Type 1)**
  - **Create low value but are required to run a business due to public law and government regulations**
- ***Pure* LVA (Type 2)**
  - **Create low value and can be eliminated, examples include unnecessary meetings, forms, approvals**

What Is Six Sigma

- Six Sigma:

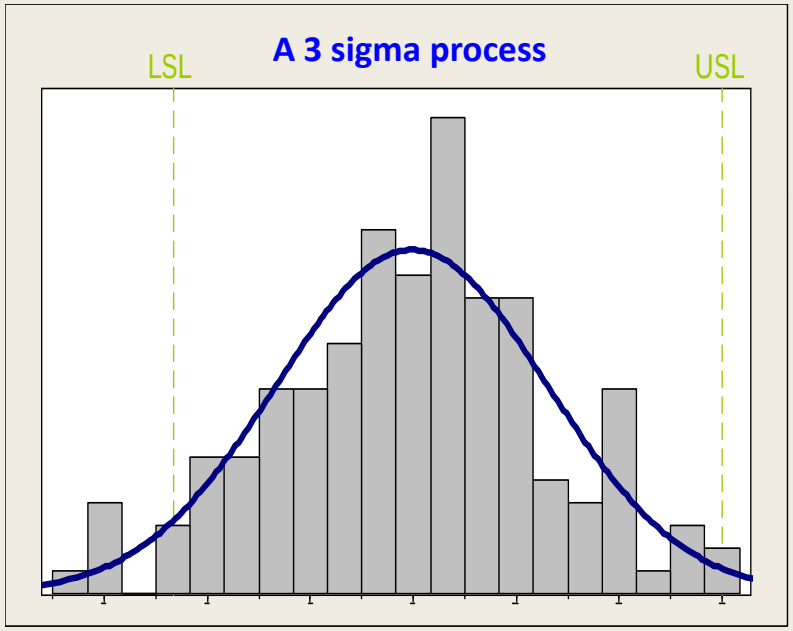
- Complements Lean by eliminating costly defects and variations from business operations
- Provides a highly structured approach/process to business improvement through the elimination of variation (defects) in products and service processes (true Six Sigma performance equates to 3.4 DPMO) - Not all processes require this level of quality
- Ensures that process objectives and outputs are targeted towards customer defined objectives
- Is typically supported by Green Belts and Black Belts executing projects under Six Sigma Master Black Belts

Six Sigma

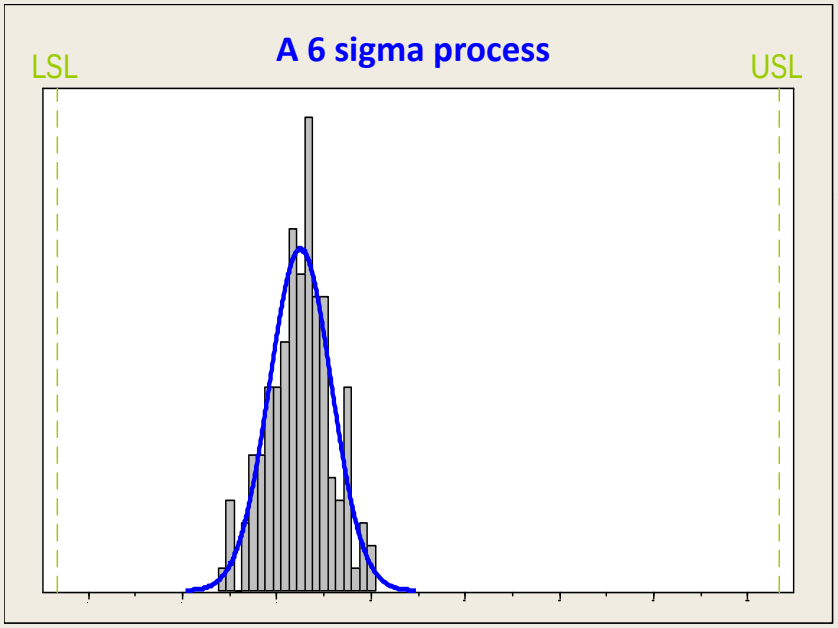
- **Where and When**
  - Concepts of Six Sigma started around 1900
  - Six Sigma was formalized at Motorola in late 1980's -- "The Nature of Six Sigma" by Dr. Harry in 1987
  - Jack Welch, the CEO of GE, widely popularized *Six Sigma* – made it the platform for promotion and success in the company
- **Definition of *Six Sigma***
  - *Six Sigma* is a ***data driven*** project methodology
  - At it's core, *Six Sigma* is about ***reducing errors/defects by reducing variation*** in processes
- ***Six Sigma*. . .**
  - Focuses on driving out process defects and variation

Spread Before And After Six Sigma

Before



After

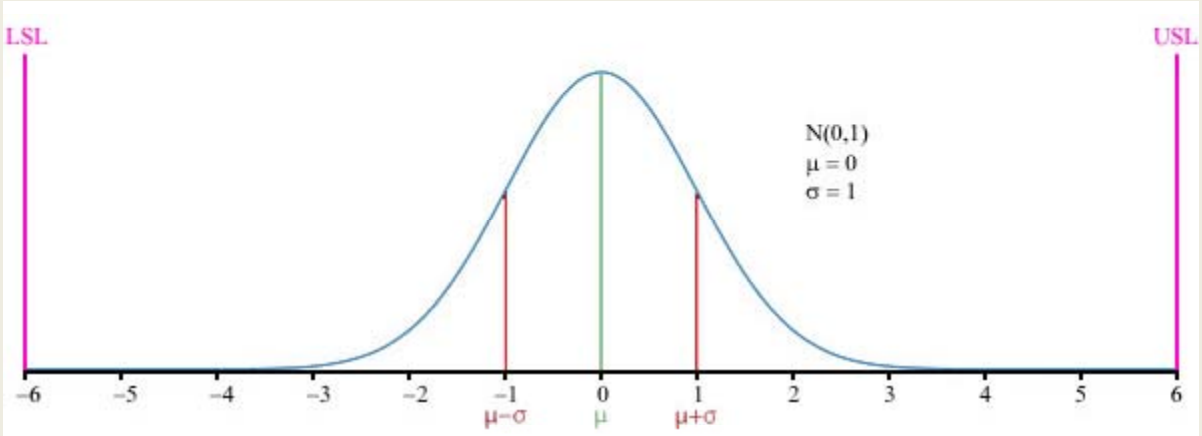


** Lean Six Sigma Projects and Results -- Part 1, Best Practices, LLC report ID 3293*

Spread is bad…..

"Squishy" is good!

Understanding Six σ



Graph of the normal distribution, which underlies the statistical assumptions of the Six Sigma model. The Greek letter **σ (sigma) marks the distance on the horizontal axis between the mean μ and the curve's inflection point.** The greater this distance, the greater is the spread of values encountered. For the curve shown above, μ = 0 and σ = 1. **The upper and lower specification limits (USL, LSL) are at a distance of 6σ from the mean.** Because of the properties of the normal distribution, values lying that far away from the mean are extremely unlikely. **Even if the mean were to move right or left by 1.5σ at some point in the future (1.5 sigma shift), there is still a good safety cushion. This is why Six Sigma aims to have processes where the mean is at least 6σ away from the nearest specification limi**t. (Wiki)

What Are Lean And Six Sigma

- Lean and Six Sigma process improvement programs have been used to <u>significantly</u> improve financial and operational performance across all sectors of the commercial business spectrum, and have extended their impact o all major business functions-and activities

- Over the past decade, the public sector has begun to adopt Lean and Six Sigma principles and roll-out internal Lean Six Sigma programs to accommodate budget cuts and staffing reductions, as well as to improve efficiency, effectiveness, and accountability

- Primary agency activities can include program marketing and outreach, training and certification, and project mentorship and oversight

Lean Six Sigma Program

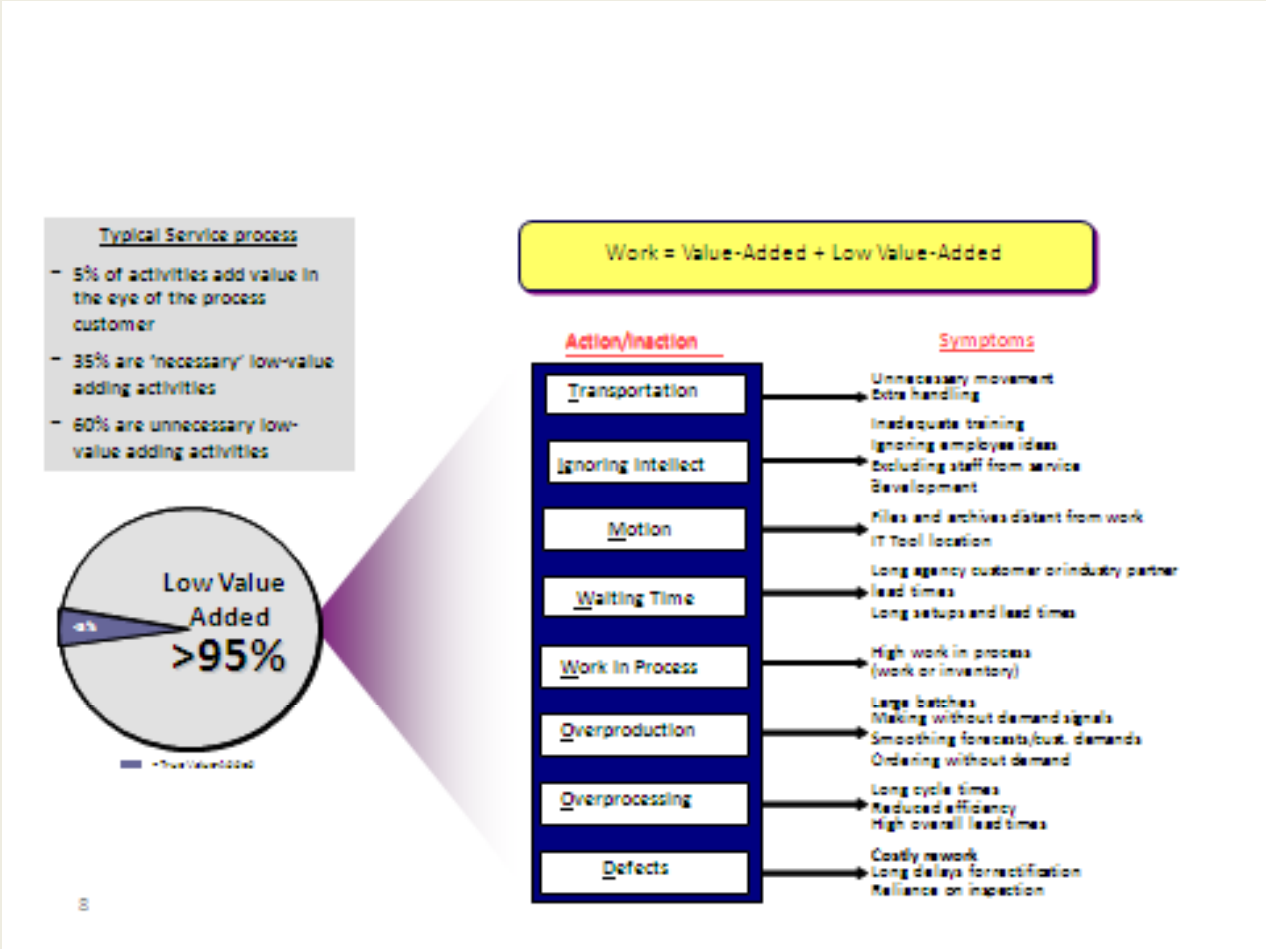
Establish a Lean Six Sigma Program That .....

- Embraces the concept of continuous improvement (sustainability) - Everyone is involved
- Supports sustainability of Lean Six Sigma - Make it so we work to align to future state vision
- Ensures project rigor drives to quantified business benefits - Making key impact on business performance
- Drives proficiency in Lean Six Sigma via the certification process – Coordinating across business lines and minimizing bureaucracy
- Provides a rewarding learning experience for all participants - Add to personal skill set
- Supports the agency-wide lean Six Sigma community - Participate and lead process improvement initiatives

Process Improvement

Process Improvement Approach	Use
Six Sigma	Six Sigma is used to identify specific root causes of process pain points (aka “defects”) and quantify the relationship(s) between a process pain point and a root cause with the aim to **reduce** process performance **variation** and **increase stability and/or predictability** of process performance.
Lean	Lean is used to identify and **remove waste** from operational processes by **mapping the process value stream** and match **process speed** (aka “flow”) to customer demand (“pull” production)
Capability Model Maturity Integration (CMMI)	CMMI is used to guide process improvement across a project, a division, or an entire organization. CMMI helps **integrate** traditionally separate organizational functions, **set** process improvement goals and priorities by **providing standardized performance definitions** for appraising current processes in IT, Services, and Acquisition organizations.
ISO 9001	ISO 9001 establishes a common set of standards and requirements for organizations to be certified ISO 9001 compliant. It is not a framework, approach, nor methodology. It is a **method to judge whether or not an organization has an effective quality program**. It is not a quality program in and of itself

TIMWWOOD


Typical Service process
- 5% of activities add value in the eye of the process customer
- 35% are 'necessary' low-value adding activities
- 60% are unnecessary low-value adding activities
Low Value Added
>95%
Work = Value-Added + Low Value-Added
Action/Inaction
Symptoms
Transportation
Unnecessary movement
Extra handling
Ignoring Intellect
Inadequate training
Ignoring employee ideas
Excluding staff from service
Development
Motion
Files and archives distant from work
IT Tool location
Waiting Time
Long agency customer or industry partner lead times
Long setups and lead times
Work In Process
High work in process (work or inventory)
Overproduction
Large batches
Making without demand signals
Smoothing forecasts/cust. demands
Ordering without demand
Overprocessing
Long cycle times
Reduced efficiency
High overall lead times
Defects
Costly rework
Long delays for rectification
Reliance on inspection
8

Understanding CPI

- Continuous Process Improvement is a program of activities designed to improve the performance and maturity of an organization's processes with regard to a set of goals
- Process improvements are planned and implemented at the organizational level
- Process improvements are based on understanding the strengths and weaknesses of the organization- the benefits are:
  - Improved customer satisfaction
  - Improved management of risk
  - Better organizational image
  - Lower costs and improved quality
  - Predictable process performance
  - Better working conditions
  - Higher employee morale
  - Improved quality of work life
  - Reduced employee turnover

The key to successful process improvement is finding the best approach to meet the business goals of the organization

Voice of the Customer (VOC)

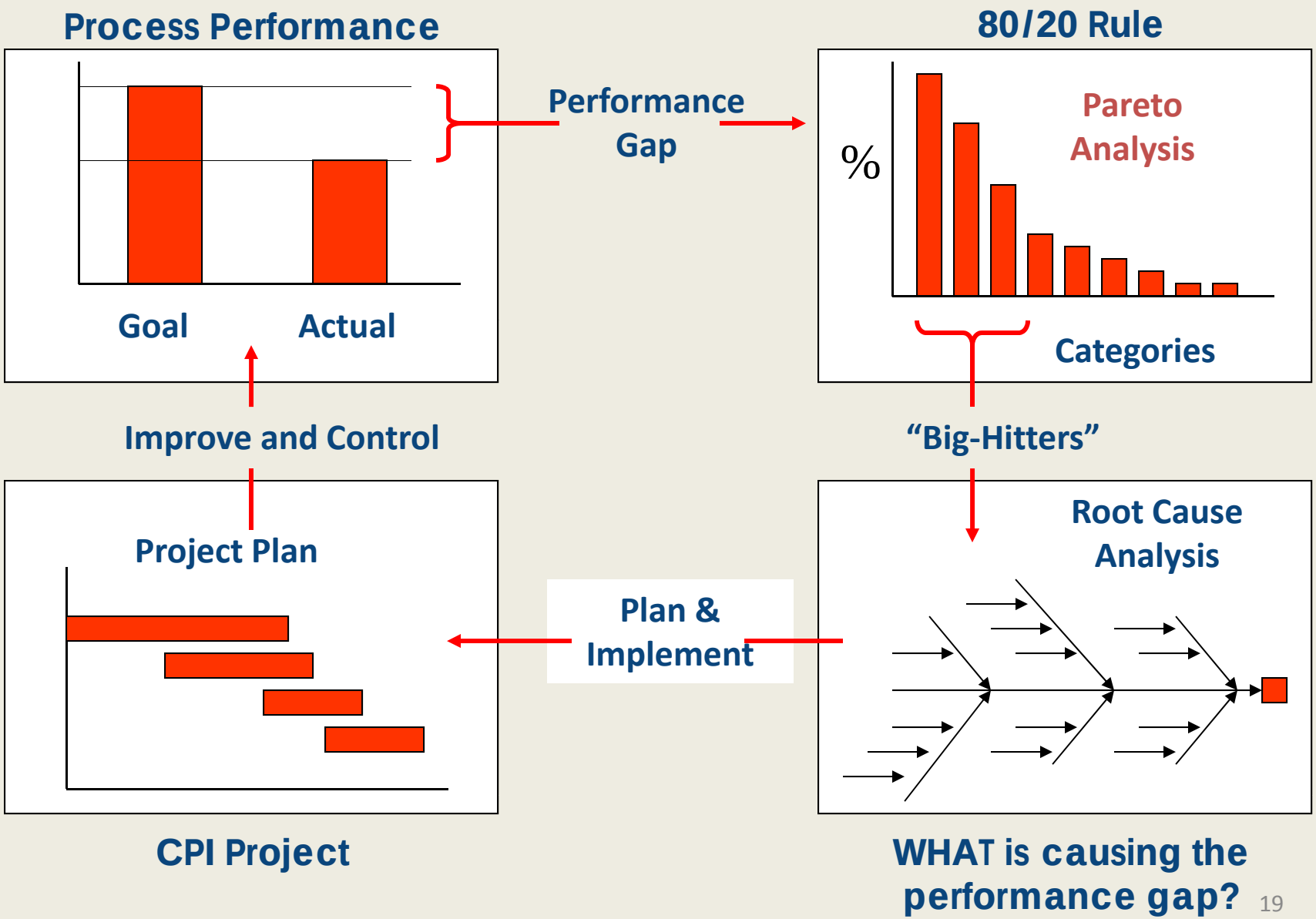
CPI projects obtain VOC as part of the Define and Measure phase.

- You must indentify all customers; Internal, External, Business, and other
- Prioritize customers
- Gather the Voice of the Customer
- Translate customer wants into critical customer requirements and prioritize them

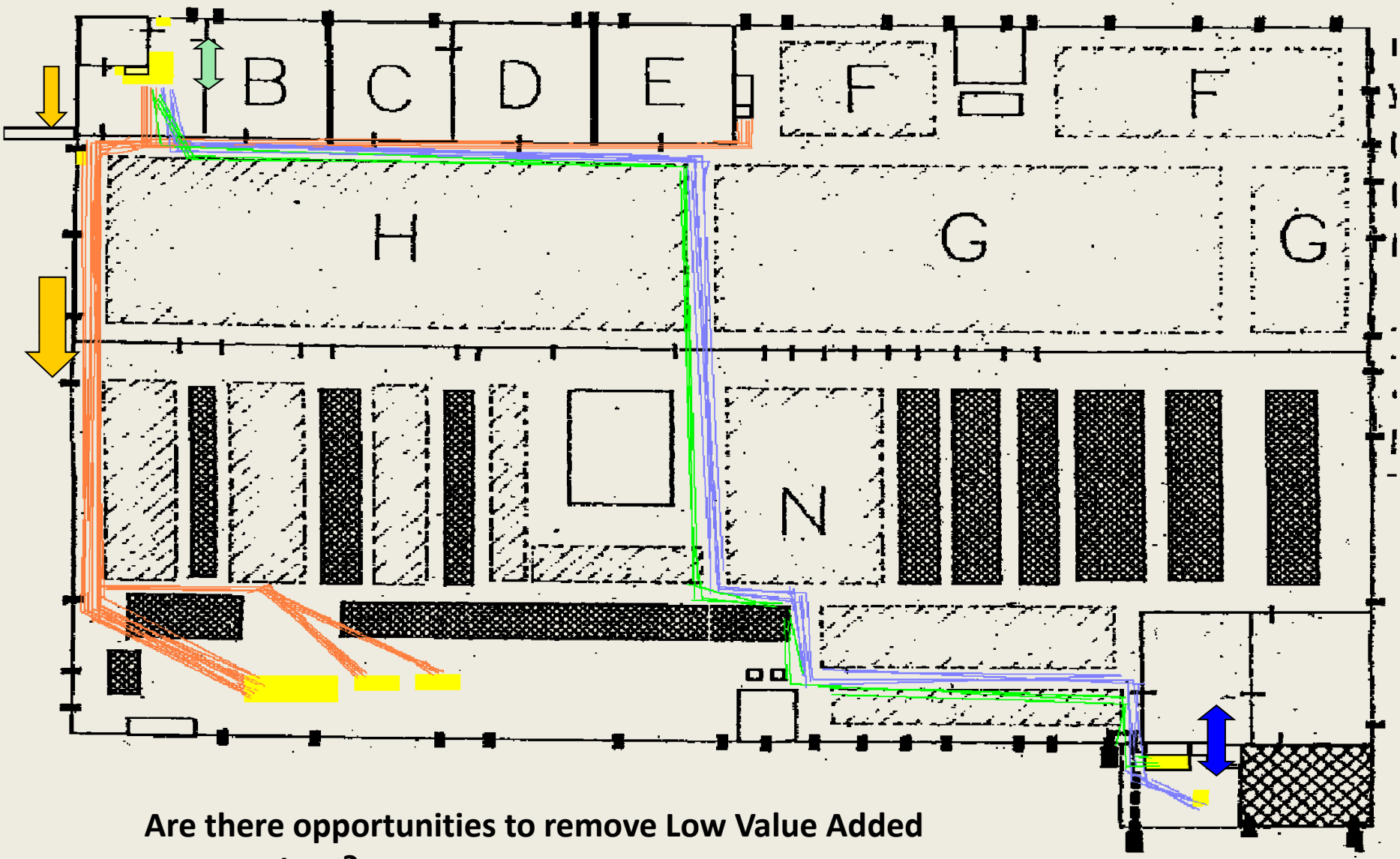
Obtain the right information to improve process for

- On-time delivery, Quality, Accuracy, Cost, Speed and Throughput to satisfy customer demands.

Tools For Organizational Analyses



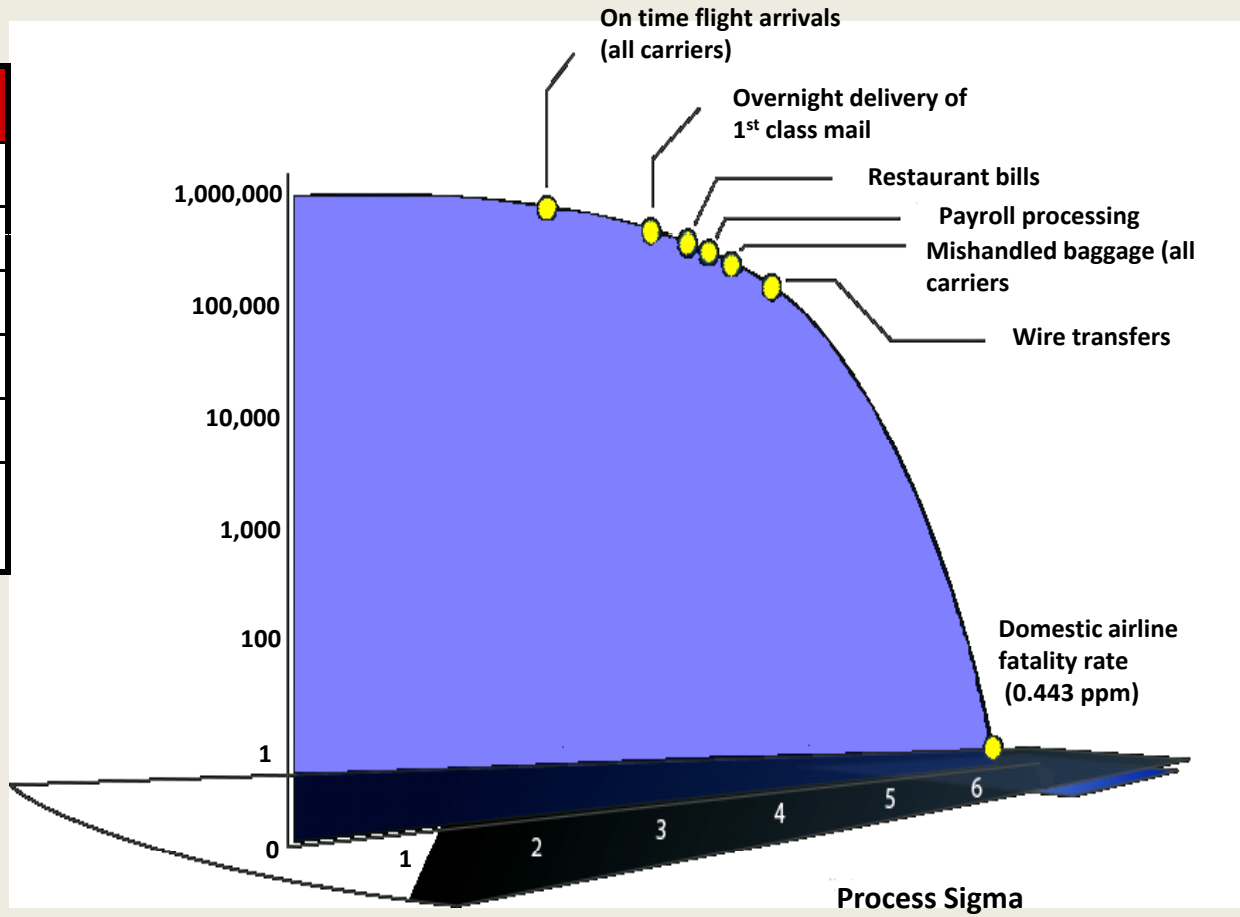
Lean Case Study



Are there opportunities to remove Low Value Added process steps?

Defects Per Million

%	DPMO	σ
93%	66,807	3.0
98%	22,750	3.5
99%	6,210	4.0
99.87%	1,350	4.5
99.977%	233	5.0
99.9997 %	3.4	6.0



Background For Dot Exercise

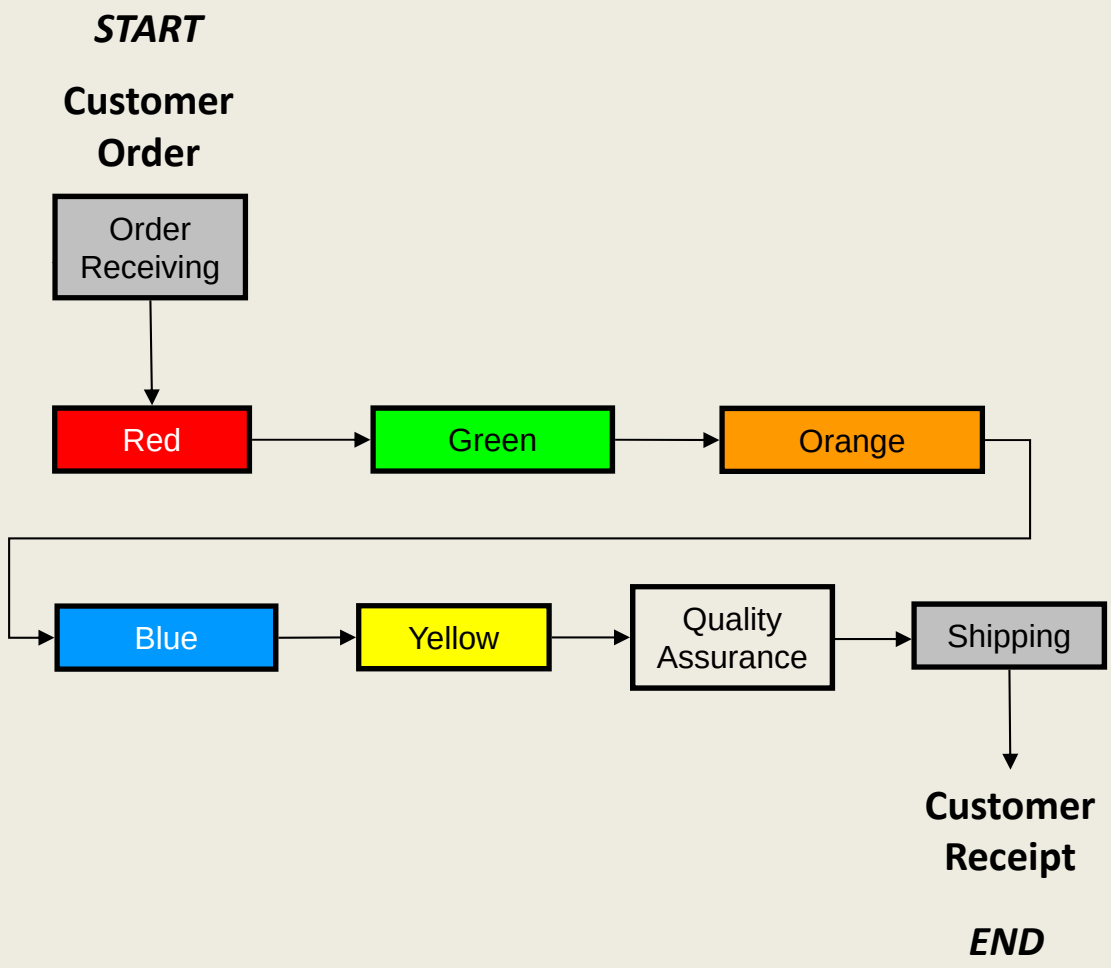
- You are a Call Technician at GSA's National Customer Service Center
- Your division is responsible for processing call-in orders from a customer at one of our largest DoD Agency Customers - Dots
- The completed orders will be papers with colored dots attached
- Your operational goals are to:
  - Work fast!
  - Do quality work!
  - Complete as many orders as a group as possible!
  - Have fun!

Dot Exercise

1. The customer will place their order on Shipping/Receiving/Supply to start the process
2. All stations can only perform their assigned tasks
3. Runners may be used for delivery of completed orders from QA to Shipping
4. We'll run process for 10 minutes
    - 10 minutes = one month
    - 2.5 minutes = one week
    - 30 seconds = 1 day (customer order frequency)

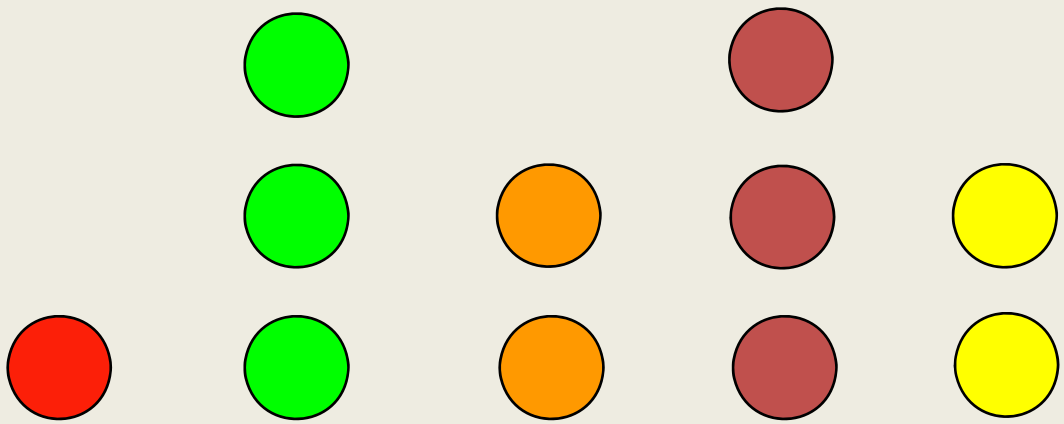
Dot Exercise

- Red Team
- Green Team
- Orange Team
- Blue Team
- Yellow Team
- Quality Assurance
- Shipping/Receiving/Supply



Order Sheet

Order Sheet, GSA
Call Center



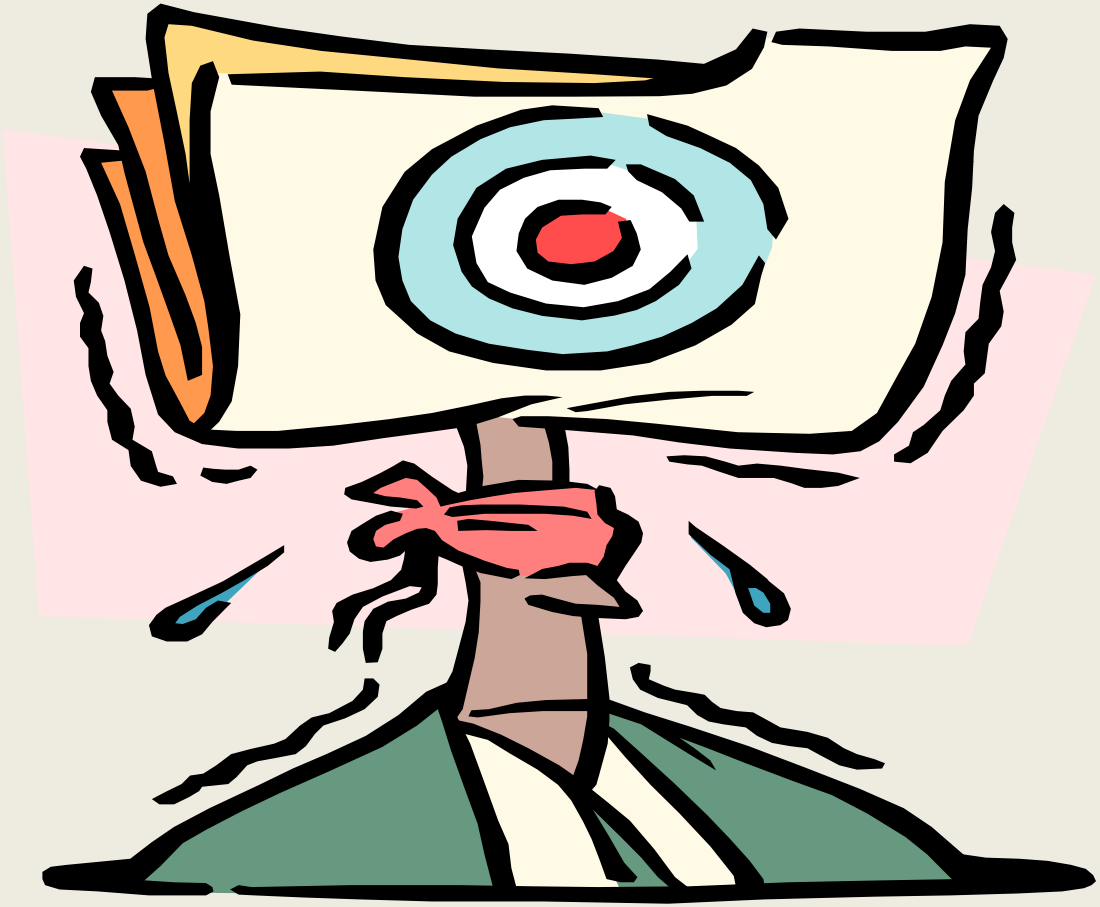
Color 1: RED | Color 2: Green | Color 3: Orange | Color 4: Blue | Color 5: Yellow

Results of Dot Exercise

	Round 1
Time to complete 1st order	
Time for each subsequent order	
Scrap (sheets)	
Customer Returns (sheets)	
Work in Progress (WIP) (sheets)	
Units Produced (sheets)	

Exercise Review

How did it go?



What Is DMAIC

DMAIC is a five-step process for solving process challenges

Define

- Who are the customers and what are their priorities? What is the performance standard?

Measure

- How is the process performing today and how is it measured? Is the data reliable?

Analyze

- What are the process' issues? What are the most important causes of the issues?

Improve

- What are the solutions to these issues and how do we implement them?

Control

- How do we sustain the benefits?

DMAIC Roadmap To CPI

Define → **Measure** → **Analyze** → **Improve** → **Control**

Define

- Identify key players
- Perform stakeholder analysis
- Create charter
- Map process
- Voice of the customer

Measure

- Calculate sigma levels
- Create detailed process maps
- Collect baseline data on defects and possible causal factors
- Create plots reflecting defect data over time and analyze for special causes
- Create and stratify frequency plots and perform Pareto analysis

Analyze

- Develop a focused problem statement
- Brainstorm potential causes
- Organize potential causes
- Collect Data
- Use statistical methods to quantify cause-effect relationship

Improve

- Involve the right people in finding solutions
- Generate solution alternatives
- Evaluate and select solution(s)
- Pilot the solution(s)
- Develop plan(s)
- Implement plan(s)
- Quantify results
- Evaluate benefits of improvements

Control

- Develop and document standard practices
- Train
- Provide continuous monitoring
- Build process for updating procedures
- Summarize and communicate learning
- Make recommendations for future

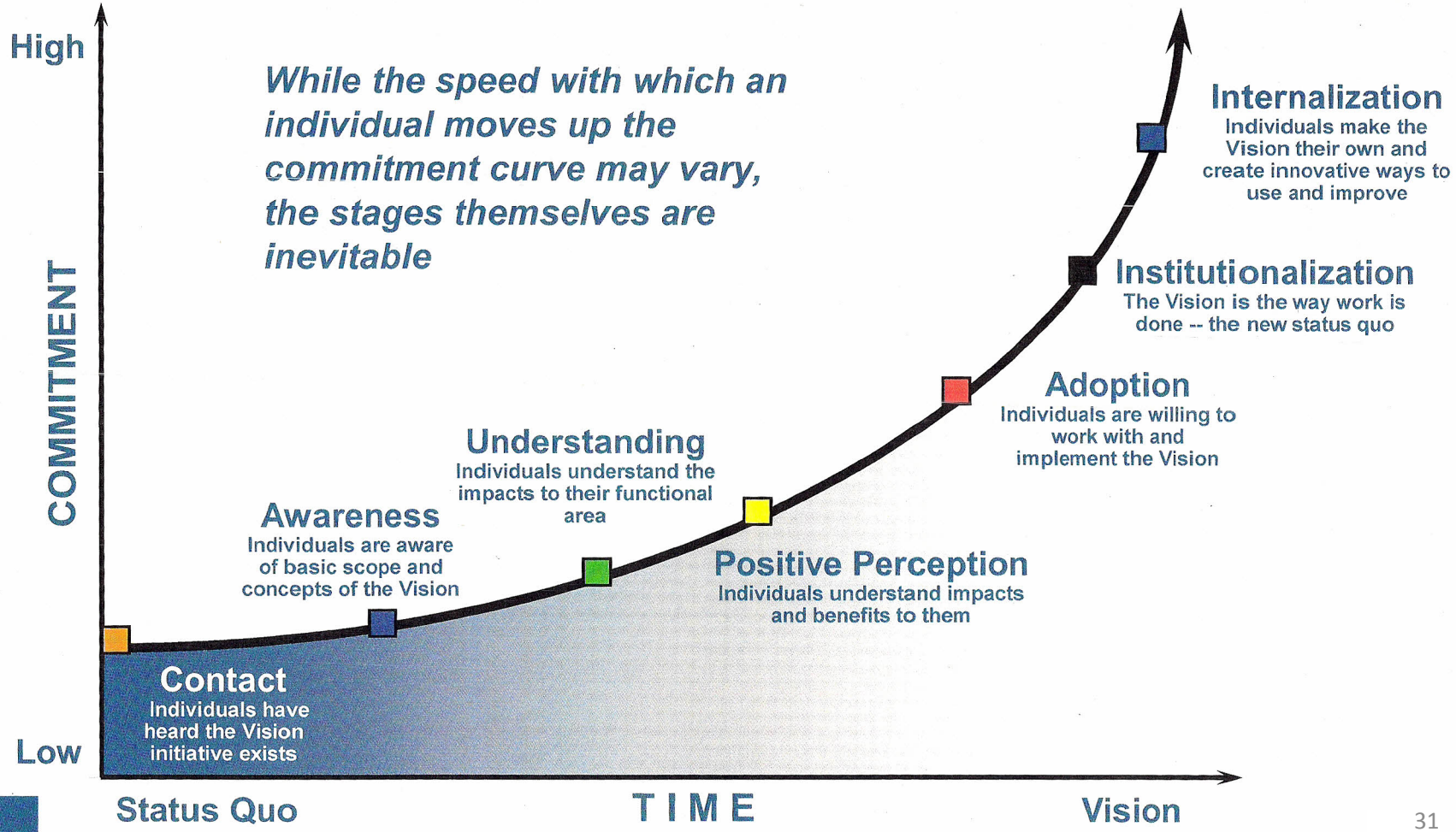
Tollgate | **Tollgate** | **Tollgate** | **Tollgate** | **Tollgate**

Tollgates are points where primary decisions, analyses, and/or deliverables should be completed

Six Sigma And The DMAIC Process

Six Sigma:Is a methodology to manage process variations to eliminate defects.

Objective: Deliver high performance, reliability and value to the end customer

DMAIC: Methodology within Lean Six Sigma to improve an existing process, and is about “solving a problem with an unknown solution

People travel up a "commitment curve" that defines the stages for building personal commitment to change