

25<sup>TH</sup> ANNUAL



25<sup>TH</sup> LCI CONGRESS  
OCTOBER 24-27, 2023

# Create, Manage, and Sustain a Lean Organization

David MacKay, Milestone Lean Consulting LLC

25 YEARS OF LEARNING: SUPERCHARGE YOUR LEAN JOURNEY IN THE MOTOR CITY

OCTOBER 26, 2023





# What is a Lean Organization?

*...a fresh look*



## Creating your Lean Strategy & Roadmap

*...where we are going and how to get there*



## Implementing the Plan

*...your lean journey*



## Managing & Sustaining your Lean Organization

*...this is who we are*





## Helping teams and organizations get great results with Lean thinking

- Last Planner® System
- 5S for the field
- Continuous Improvement
- Lean in your organization
- AGC Lean Construction Education Program for CM-Learn

**“David is a thought leader in the lean design and construction industry. He is passionate about Lean, but also practical. David can take what sounds complicated and make it simple.” - Eric Lusia, Senior Director, Continuous Improvement, AECON GROUP, INC., Canada**



**CM-LEAN**  
CERTIFICATE OF  
MANAGEMENT  
LEAN CONSTRUCTION



### A DEEP UNDERSTANDING OF LEAN WITH A SIMPLE APPROACH

- ◆ Active consultant partner member of the Lean Construction Institute. LCI Los Angeles / Orange County Community of Practice Core Group
- ◆ Created the “5S in Lean Construction” training program for the Lean Construction Institute
- ◆ Approved and active trainer Associated General Contractors Lean Construction Education Program
- ◆ Co-developed “Creating, Managing and Sustaining a Lean Organization” presented multiple times a LCI Congress

### EFFECTIVE TEACHER, FACILITATOR, AND COACH

- ◆ Facilitated hundreds of Last Planner System pull planning and weekly work planning sessions for construction and design
- ◆ Taught and mentored hundreds in planning and scheduling.
- ◆ Coached teams in Value Stream Mapping, 5S, Root Cause Analysis, and other Lean methods
- ◆ Brought Lean thinking and methods to projects, districts and supported North American implementation at PCL

### 30+ YEARS OF REAL CONSTRUCTION EXPERIENCE

- ◆ Project team member on a wide variety of project types, sizes, and delivery methods including process, petro-chemical, power generation, lab and research, student and multi-family housing, sports, entertainment, theme parks, schools, medical, airport, parking structures, and others working directly with trades, owners, and design teams
- ◆ Learning and Production Manager, Project Controls Manager, Scheduling Manager, Scheduling Engineer, assist project manager and field engineering





# What is a problem?

The **gap** between where you are (current) and where you want to be (future)

Problem solving – Closing the gap



**3. How get there?**

**4. Implement**

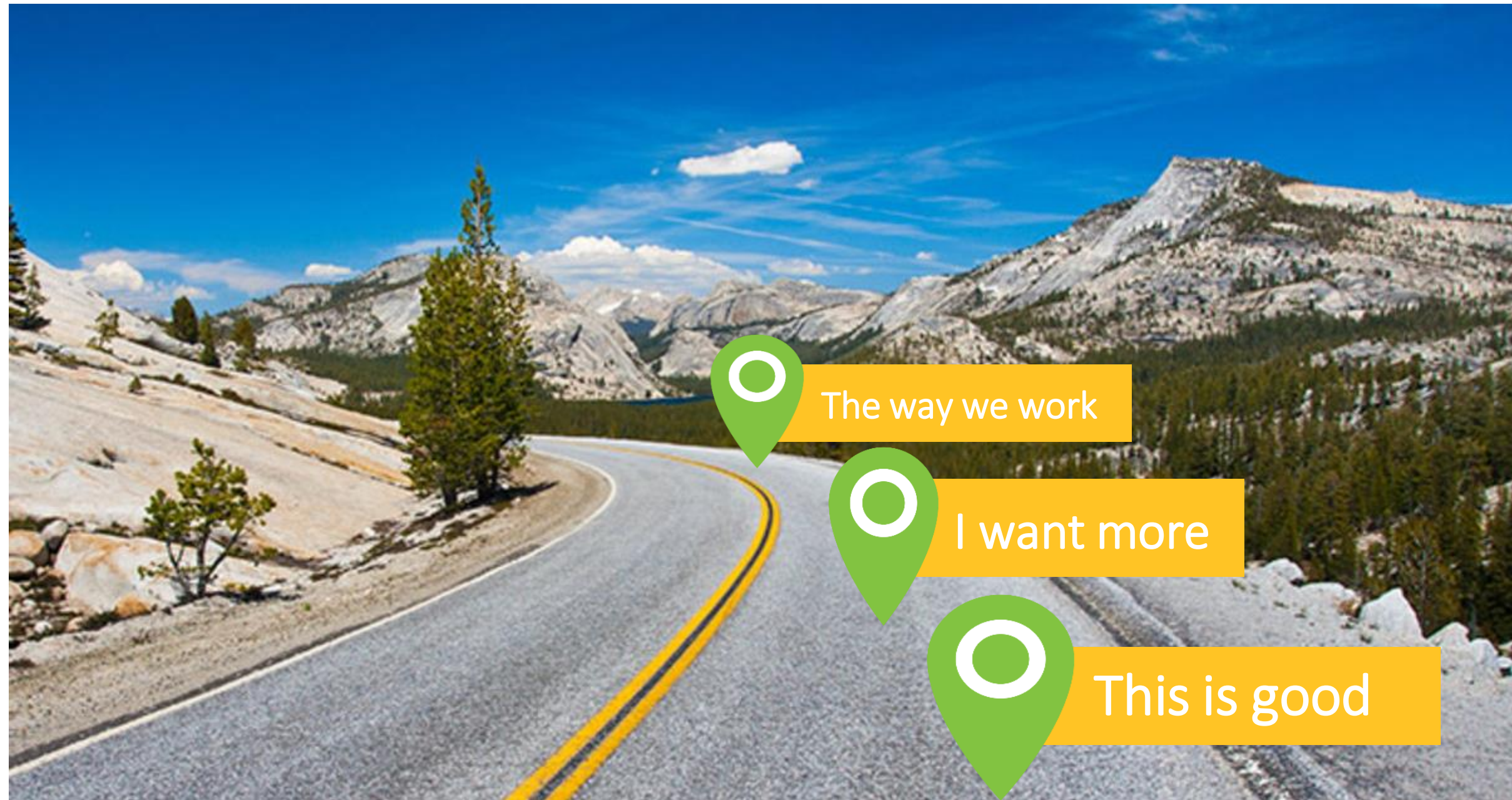
**2. Where want to be? (Future)**

**1. Where now? (Current)**





# YOUR LEAN JOURNEY – Why a Journey?








Where are we now?  
Why do we want to do this?




Where/who do we want to be?



How do we get there?



How we know we are on track?  
(KBI's & KPI's)



Implement the Plan  
Check and Adjust



<b>WHAT PROBLEM ARE WE TRYING TO SOLVE? WHY IS THIS IMPORTANT?</b> <b>WHAT IS OUR CURRENT CONDITION?</b> How do things work today? What is our business strategy? What progress have we made so far? What constraints?	
<b>BUSINESS STRATEGY</b> sets the direction: What is our long-term vision? What markets do we serve? What value do we provide to our customers? What differentiates us in the marketplace? Who is our customer?	
<b>OPERATIONS STRATEGY</b> is focused on: How will you produce value? A Lean strategy is to do it as a continuously improving flow efficient organization. It must always connect with the business strategy. What methods and tools will we use? Who will be responsible?	
<b>ROADMAP</b> is the plan on how you get there. What major steps will get us from where we are to where we want to be (close the gap)? What is the timing? How will we measure?	
<b>JOURNEY</b> is the implementation of your roadmap. What will I do over the next 3-6 months?	



# What is a Lean Organization?

*...a fresh look*





# Lean Organization

## Lean Project

- Usually how first experience Lean...
- Improve schedule performance, productivity, quality, safety
- Lower cost
- Less delays and issues
- Involve all parties from owner, design, GC, trades and users.

&

## Lean Organization

- ...then we want more.
- Repeat success across all our projects
- Bring benefits of lean thinking and application to all departments and processes.

Lean organizations support lean projects





Where will your Lean journey take you?

Discuss with your table...

What does a Lean **organization** look like?

*(5 minutes)*



Tell us about your Lean Journey so far?  
Which does it look like?





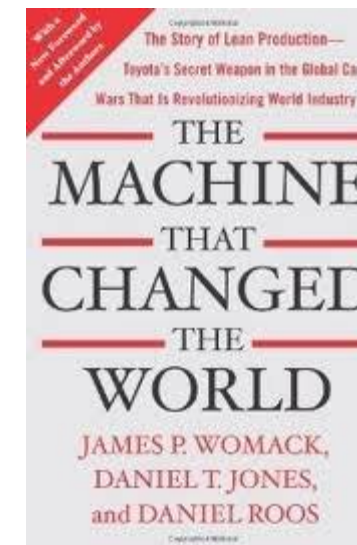
# What does it mean to be lean?

## Preface to the first edition of *Lean Thinking*

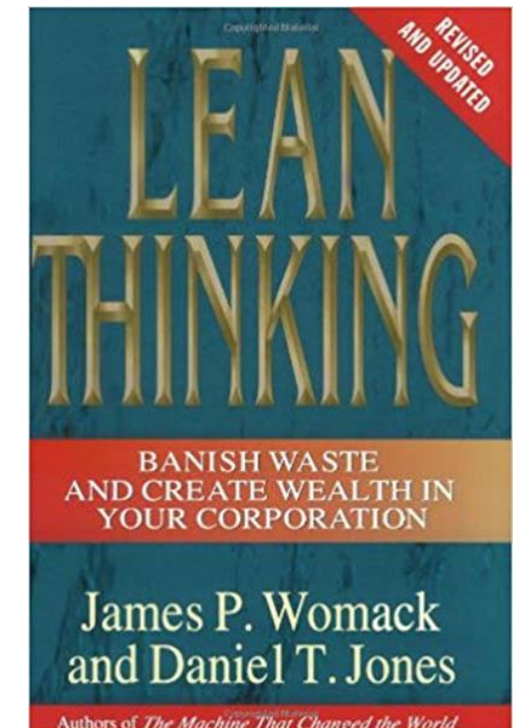
First, we realized that we needed to concisely summarize the principles of “**lean thinking**” to provide a sort of North Star, a dependable guide for action for managers striving to transcend the day-to-day chaos of mass production. This summary was hard for most readers to construct because the Japanese originators of lean techniques worked from the bottom up. They talked and thought mostly about specific methods applied to specific activities in engineering offices, purchasing departments, sales groups, and factories... Although they wrote whole books describing specific techniques and a few high-level philosophic reflections as well (such as memoirs of Taiichi Ohno), the thought process needed to tie all the methods together into a complete system was left largely implicit. As a result, we met many managers who had drowned in techniques as they tried to implement isolated bits of a lean system without understanding the whole.

After interactions with many audiences and considerable reflection, we concluded that lean thinking can be summarized in five principles: precisely specify *value* by specific product, identify the *value stream* for each product, make value *flow* without interruptions, let the customer *pull* value from the producer, and pursue *perfection*. By clearly understanding these principles and then tying them all together, managers can make full use of lean techniques and maintain a steady course.

1991



1996



# What does it mean to be lean?

“Lean is a way of thinking,  
not a list of things to do.”

- Shigeo Shingo



**Lean thinking** is universal. It is based in principles. It is the same for all industries and organizations.

**Lean Construction** is lean methods developed or adapted to meet the specific needs of the design and construction industry.



# What is Lean Construction?

Lean Construction is a “way to design production systems to minimize waste of materials, time, and effort in order to generate the maximum possible amount of value,” (Koskela et al. 2002<sup>[1]</sup>).

Lean Construction recognizes that desired ends affect the means to achieve these ends, and that available means will affect realized ends (Lichtig 2004). Essentially, Lean Construction aims to embody the benefits of the Master Builder concept (Abdelhamid et al. 2008).

Lean construction supplements traditional construction management approaches with (Abdelhamid 2007): (1)

two critical a

consideration

project and

While lean c

how it is pra

Construction

construction

observed in the reliability of weekly production planning.

Getting work to flow reliably and predictably on a construction site requires the impeccable alignment of the entire supply chain responsible for constructed facilities such that value is maximized and waste is minimized.

With such a broad scope, it is fair to say that tools found in Lean Manufacturing and Lean Production, as practiced by Toyota and others, have been adapted to be used in the fulfillment of Lean construction principles.

The three unique tools and methods that were specifically conceived for lean construction are the Last Planner System, Target Value Design, and the Lean Project Delivery System.

**“In any case, the term Lean Construction has escaped canonical definition. There has been a number of reasons for that. The body of knowledge is in a state of development since 1990. Nonetheless, a definition is needed to be able to operationalize the concepts and principles contained in the philosophy.”**



WIKIPEDIA  
The Free Encyclopedia

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origin of lean

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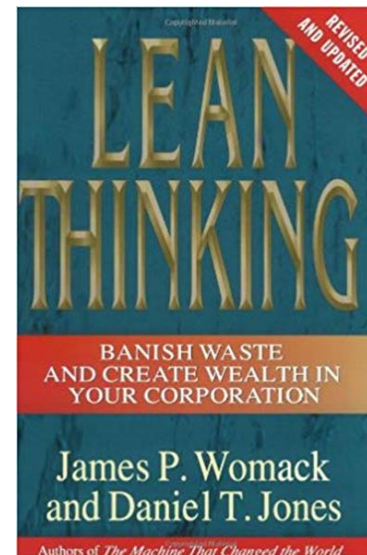
# What is “Lean”?

Lean thinking and practice has been developing for decades. As a result, there is no single agreed definition across all industries or even in the Lean Construction community. We consider this to be the current best definition:

**Pull value to the customer  
with the least waste  
by flow efficiency  
and do it better and better.**

## The Six Tenets of Lean

The **Lean Construction Institute** has isolated six key tenets of Lean



- **Specify value. Defined by customer. Created by producer.**
- **Value stream is the set of actions to deliver a product.**
- **Make the value creating steps flow.**
- **Pull value to the customer.**
- **Aim for perfection.**



**Pull value to the customer** with the least waste by flow efficiency and do it better and better.

## **PULL**

Produce in  
response to a  
demand

## **VALUE**

Defined by our  
customer



**CUSTOMER**

**Pull value to the customer** with the least waste by flow efficiency and do it better and better.

## Pull

Produce in response to a demand. It is to produce what the customer wants, just when the customer wants it. Right product, right quantity, right time.

The customer pulls value from the producer



**How is Subway an example of “pull”?**

***In our business, does pull apply mostly to external or internal customers?***



Pull **value** to the customer with the least waste by **flow** efficiency and do it better and better.

**FLOW**

The Work - **VALUE STREAM**

**PULL**

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# Flow

Forward movement in a process

We want work to flow efficiently

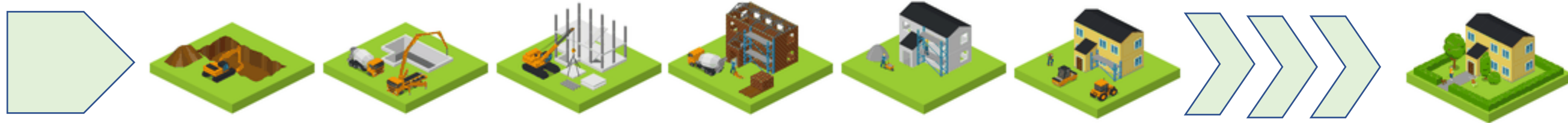




**Pull value to the customer** with the least waste by flow efficiency and do it better and better.

# Value Stream

The set of actions to deliver a customer request. It is understood in relation to flow and value



## Examples:

- Project from RFQ through Final Completion
- Equipment from order to delivery
- Hiring from request to on board

*Wherever there is a request and a deliverable,  
there is a **value stream***

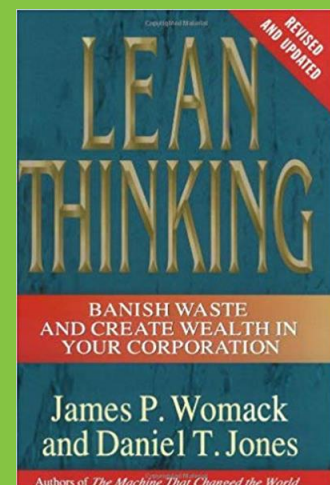
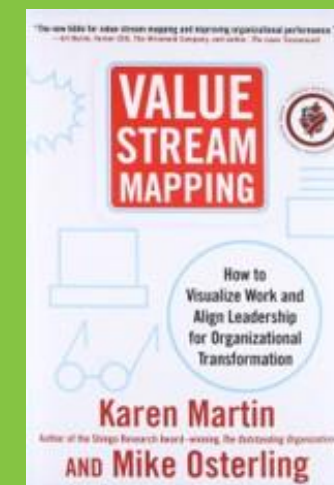
# Value Stream Management

- Focus on the flow of value through all the value adding steps
- Optimize the system rather than individual steps
- Break down “Silos”. Encourage collaboration. Shift thinking from success of the individual, department, design discipline, or trade partner to success of the entire team.
- Build customer-centric processes



“The most basic problem is that flow thinking is counterintuitive... shift the focus from organizational categories (departments) to value-creating ‘processes.’”

– James Womack and Daniel Jones, *Lean Thinking*





Pull value to the customer **with the least waste** by flow efficiency and do it better and better.

*No waste*

*No bottlenecks*

*No constraints*

**FLOW**

The Work - VALUE STREAM

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# Waste

It is the opposite of value

**Waste** – Know the eight wastes

**Variation** – In flow, such as bottlenecks, and in quality/results

**Overburden** – Physical strain, in over our head without enough training, tools pushed to the limit



## EIGHT WASTES

Waste is anything that doesn't add value.



### Defects

Efforts caused by rework, scrap, and incorrect information.



### Overproduction

Production that is more than needed or before it is needed.



### Waiting

Wasted time waiting for the next step in a process.



### Non-Utilized Talent

Underutilizing people's talents, skills, & knowledge.



### Transportation

Unnecessary movements of products & materials.



### Inventory

Excess products and materials being processed.



### Motion

Unnecessary movements by people (e.g. walking).



### Extra-Processing

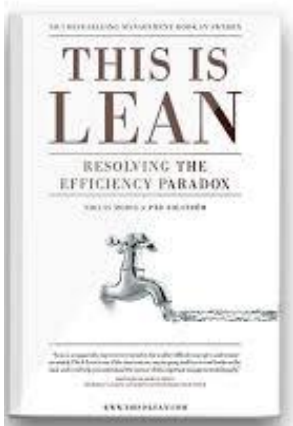
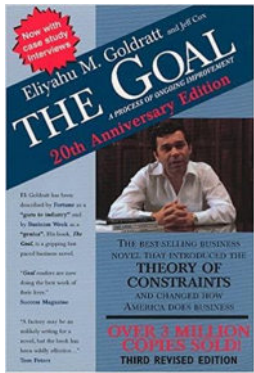
More work or higher quality than is required by the customer.



Pull value to the customer with the least waste by **flow efficiency** and do it better and better.

No waste  
No bottlenecks  
No constraints

**FLOW EFFICIENCY**



The Work - VALUE STREAM

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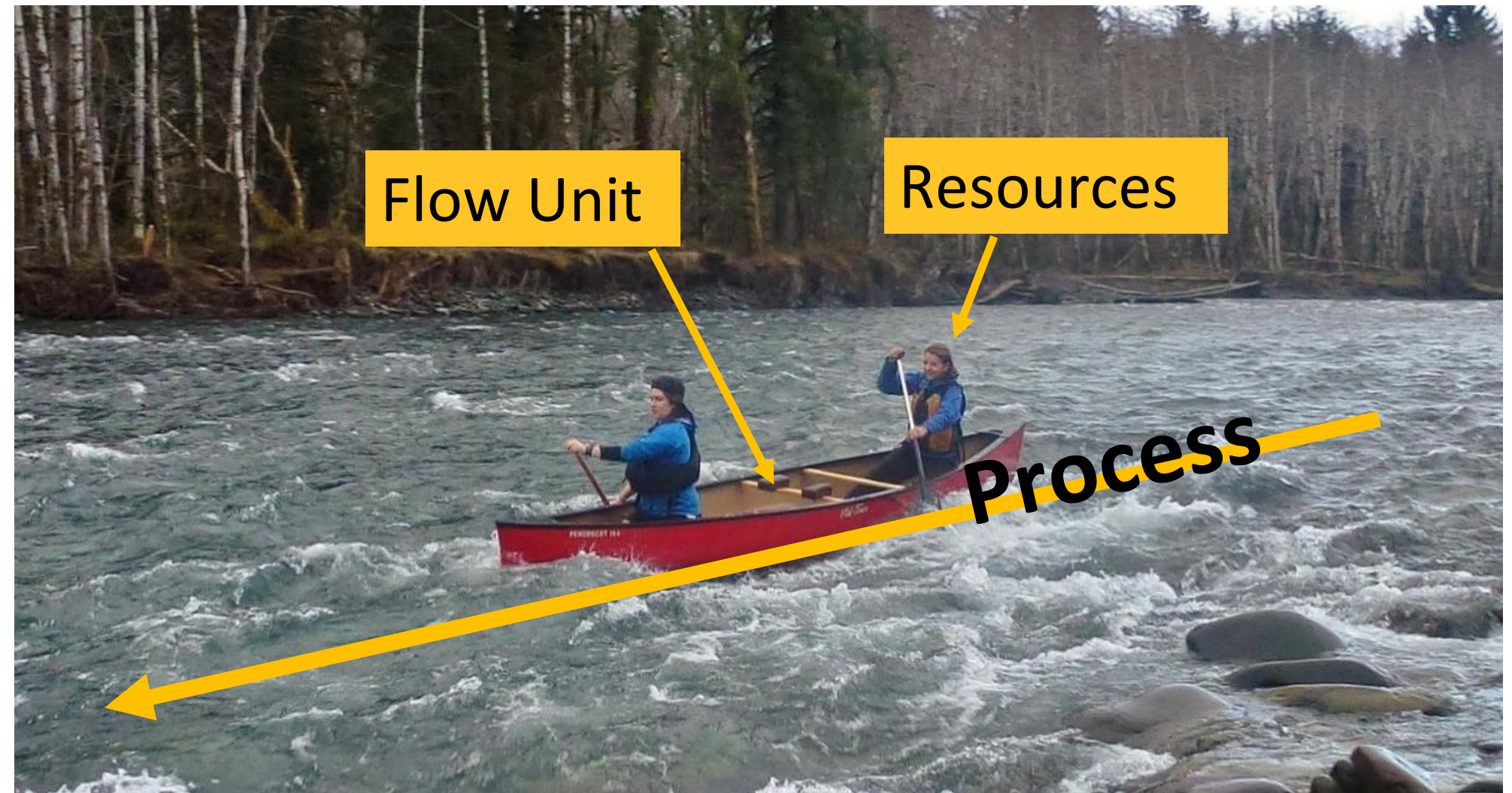
**CUSTOMER**

Pull value to the customer with the least waste by **flow efficiency** and do it better and better.

## Flow Efficiency

In a process, efficiency from the point of view of the thing being transformed.

The flow unit moves through all the value adding steps from request to completion with as little waste as possible.



How is flow efficiency like paddling a canoe?



# HOW DO WE DELIVER VALUE?

Producer



Customer

**Lean is a way of thinking about the process of adding value**

**What distinguishes Lean from other theories of production is the focus on flow efficiency over resource efficiency**

**Pull value to the customer with the least waste by flow efficiency and do it better and better.**

*No waste*

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**FLOW EFFICIENCY**

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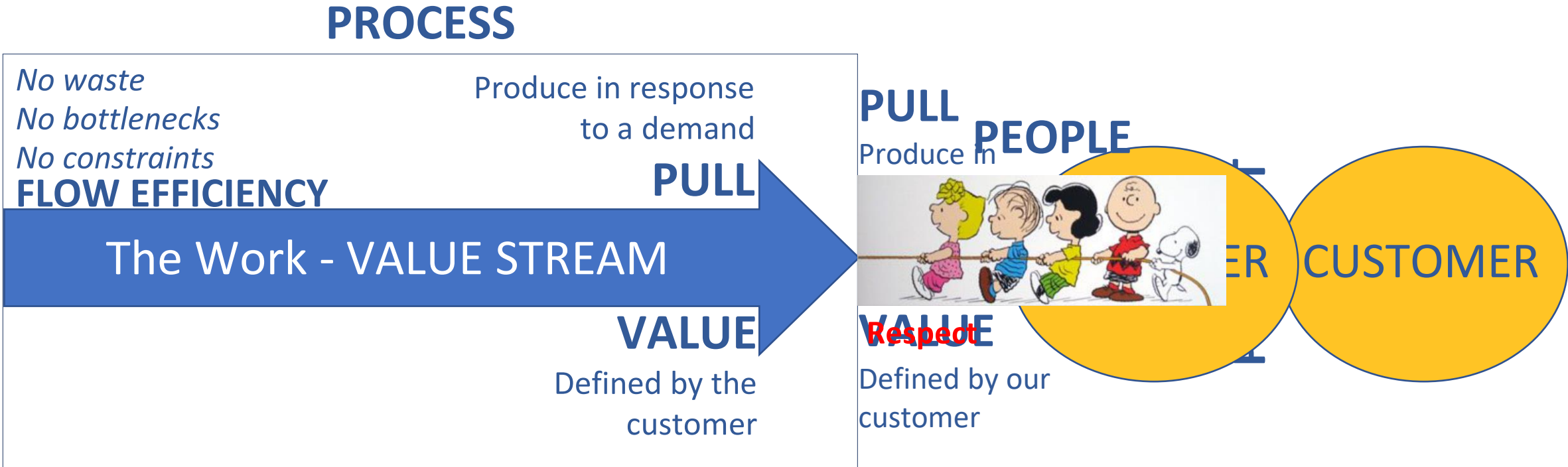
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Pull value to the customer with the least waste by flow efficiency and do it better and better.



PEOPLE make it go  
What is meant by “Respect for People”?



## PEOPLE make it go

### What is meant by “Respect for People”?

### How do you show respect?



Executive Leadership

### Respect for People

By James (Jim) Womack, PhD

December 20, 2007

<https://www.lean.org/the-lean-post/articles/respect-for-people/>

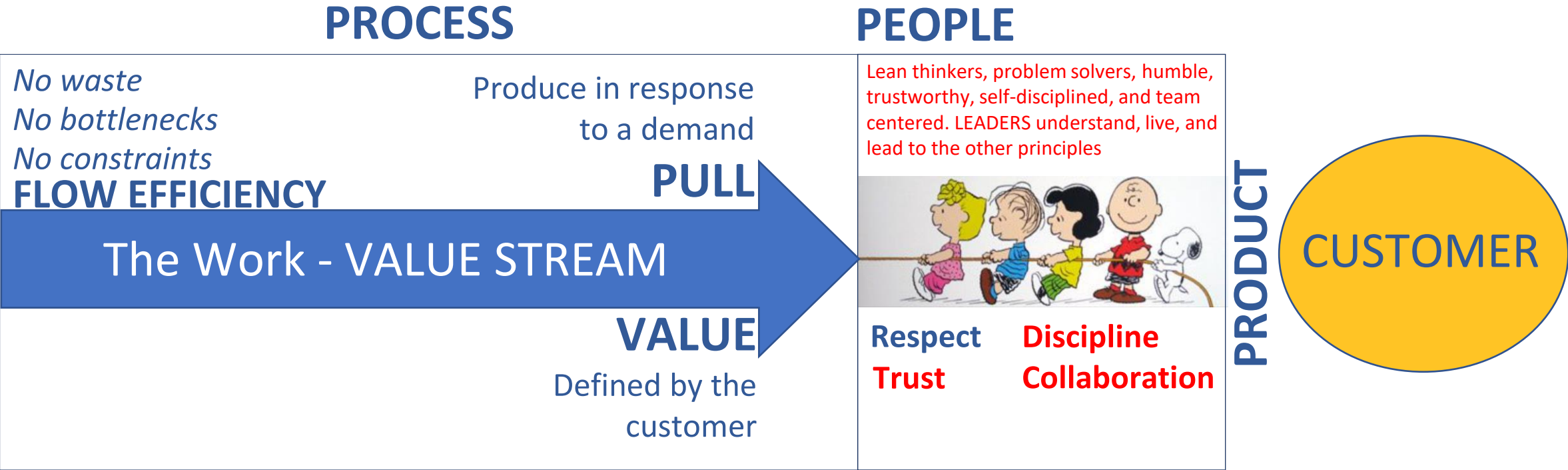
The challenge for those of us in the Lean Community is to embrace and explain the true nature of mutual respect for people – managers and associates – so all organizations can move toward a new and better way of solving their problems.

Over time I’ve come to realize that this problem solving process is actually the highest form of respect. The manager is saying to the employees that the manager can’t solve the problem alone, because the manager isn’t close enough to the problem to know the facts. He or she truly respects the employees’ knowledge and their dedication to finding the best answer. But the employees can’t solve the problem alone either because they are often too close to the problem to see its context and they may refrain from asking tough questions about their own work. Only by showing *mutual* respect – each for the other and for each other’s role – is it possible to solve problems, make work more satisfying, and move organizational performance to an ever higher level.

“The work here is always challenging because we are always solving problems using a method we all understand. And we all respect each other’s contribution.”



Pull value to the customer with the least waste by flow efficiency and do it better and better.



Pull value to the customer with the least waste by flow efficiency and do it better and better.

## PURPOSE

**Organizational Alignment on purpose, vision, and goals**



Guides decisions.  
It is how success is measured.  
Customer focused

## PROCESS

*No waste*  
*No bottlenecks*  
*No constraints*

**FLOW EFFICIENCY**

Produce in response to a demand

**PULL**

The Work - VALUE STREAM

**VALUE**

Defined by the customer

## PEOPLE

Lean thinkers, problem solvers, humble, trustworthy, self-disciplined, and team centered. LEADERS understand, live, and lead to the other principles



**Respect**  
**Trust**

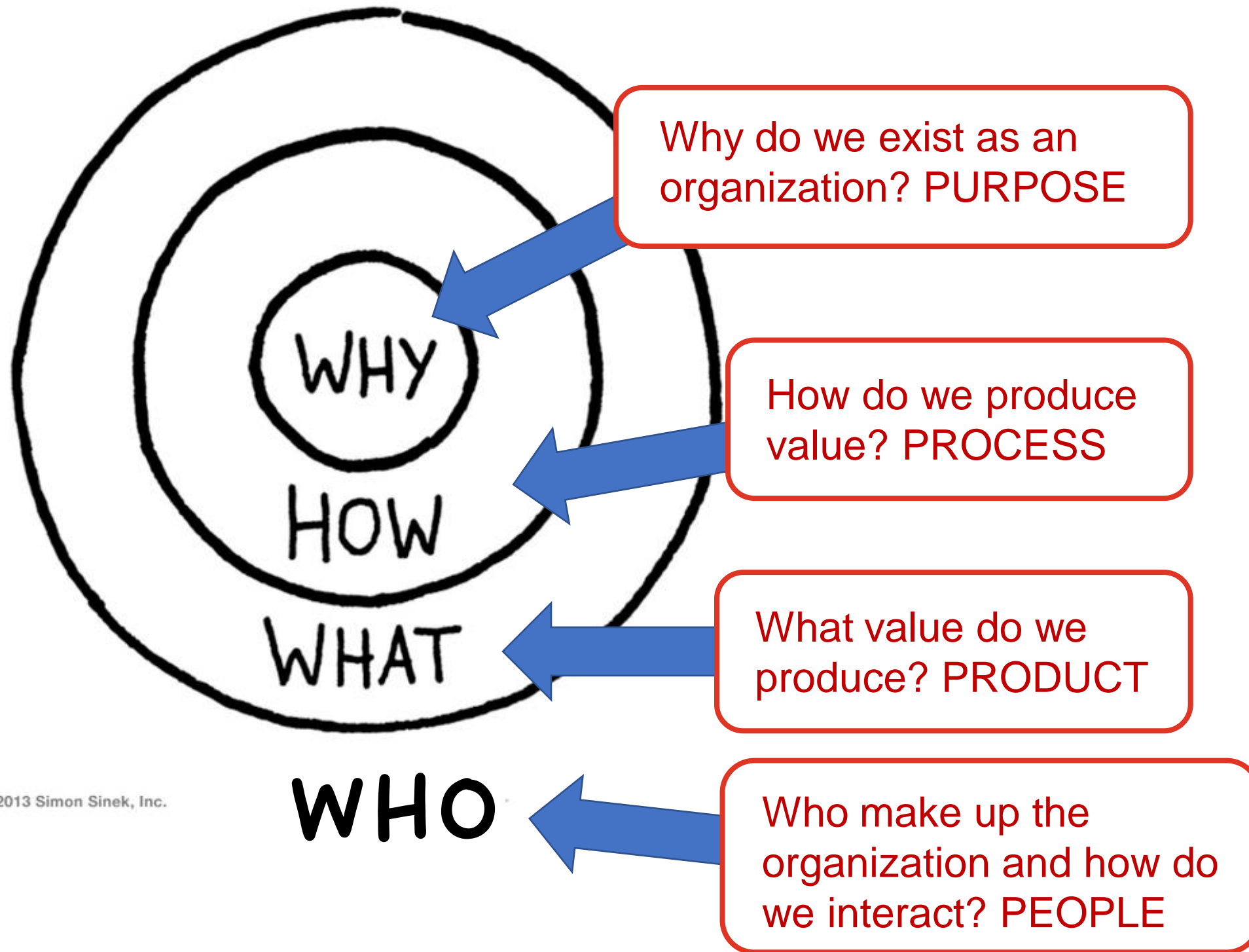
**Discipline**  
**Collaboration**

**PRODUCT**

**CUSTOMER**

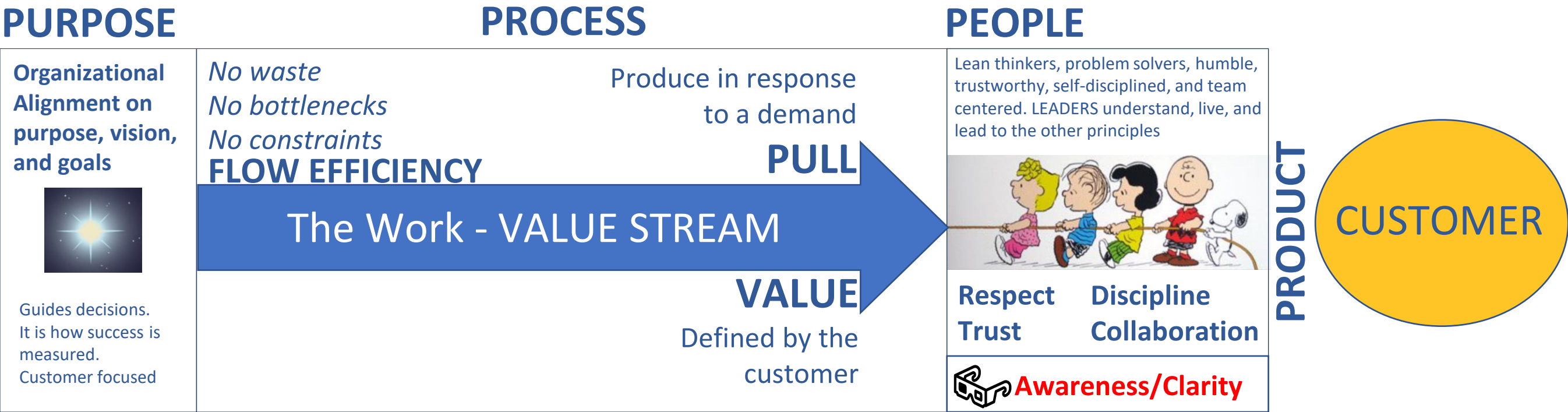


# Basic answers that every person in the organization must know **Alignment**



© 2013 Simon Sinek, Inc.

Pull value to the customer with the least waste by flow efficiency and do it better and better.



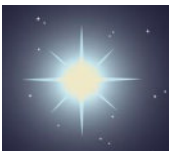
**AWARENESS** is to see everything all the time. It is seeing things as they really are. It is understanding “why”. It is the basis for good decisions. Clarity. Necessary for alignment.



Pull value to the customer with the least waste by flow efficiency **and do it better and better.**

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The Work - VALUE STREAM

CONTINUOUS IMPROVEMENT

People  
Process  
Product

VALUE

Defined by the customer

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Respect  
Trust

Discipline  
Collaboration



Awareness/Clarity

PRODUCT

CUSTOMER

Continuous

Ongoing. Never ending.  
Always looking to improve  
and a process to do it.



A systematic ongoing  
effort to improve

*Get better and better at moving the  
canoe down the river*

Pull value to the customer with the least waste by flow efficiency and do it better and better.

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The Work - VALUE STREAM

**CONTINUOUS IMPROVEMENT**

*People*  
*Process*  
*Product*

**VALUE**

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## PEOPLE & PARTNERS

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centered. LEADERS understand, live, and  
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**Respect**  
**Trust**

**Discipline**  
**Collaboration**



**Awareness/Clarity**

**PRODUCT**

**CUSTOMER**

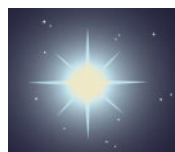
## PARTNERS

How important are design partners, construction partners, and suppliers to  
the success of your organization?

# Lean Organization

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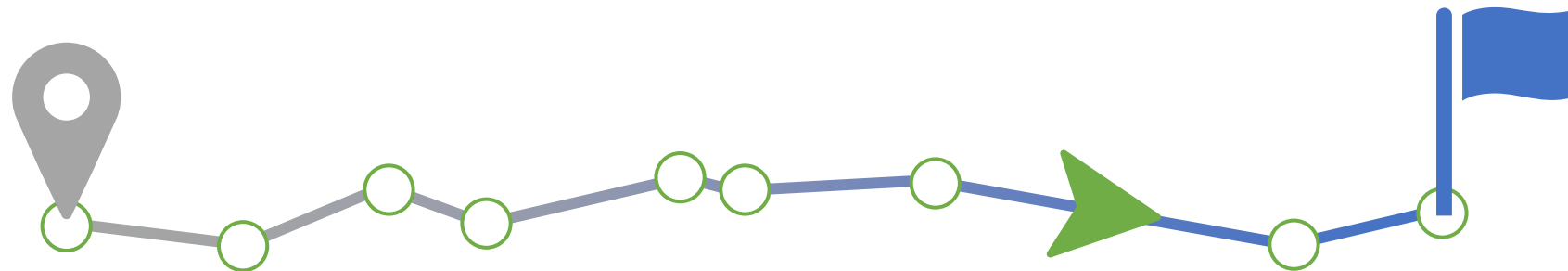
**CUSTOMER**

**Pull value to the customer with the least waste by flow efficiency and do it better and better.**



# How do I “Operationalize” the concepts and principles?

1. Develop **People** who apply *Lean thinking* to their daily work
2. Provide a **System** (or process) to support them



“Train the people doing the work to spot problems and then utilize their knowledge and skills to help improve the work”

– Steven Spear,  
*The High-Velocity Edge*

# Lean Organization

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**Respect**  
**Trust**

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**Collaboration**

**Awareness/Clarity**

**PRODUCT**



All of these principles, methods, and tools are based on and support the core principles. Some may change over time, such as LPS or Modular construction, but the core principles never change.

**Pull value to the customer with the least waste by flow efficiency and do it better and better.**

1. Develop **People** who apply Lean thinking to their daily work
2. Provide a **System** (or process) to support them

**Lean Culture** – Behavior based in lean principles and process

**A Learning Organization** - Structured to continuously improve

**Lean Methods and Tools** that put principles in action

**Supporting Principles**

**Manage by Value Stream**



1. Design the best process you can
2. Document (Standard Work)
3. Continuously improve (Kaizen)

**Problem Solving** – Identify and close the gap between where we are and want to be



- Understand the current state
- Design a future state
- Create a transformation plan
- Implement the plan

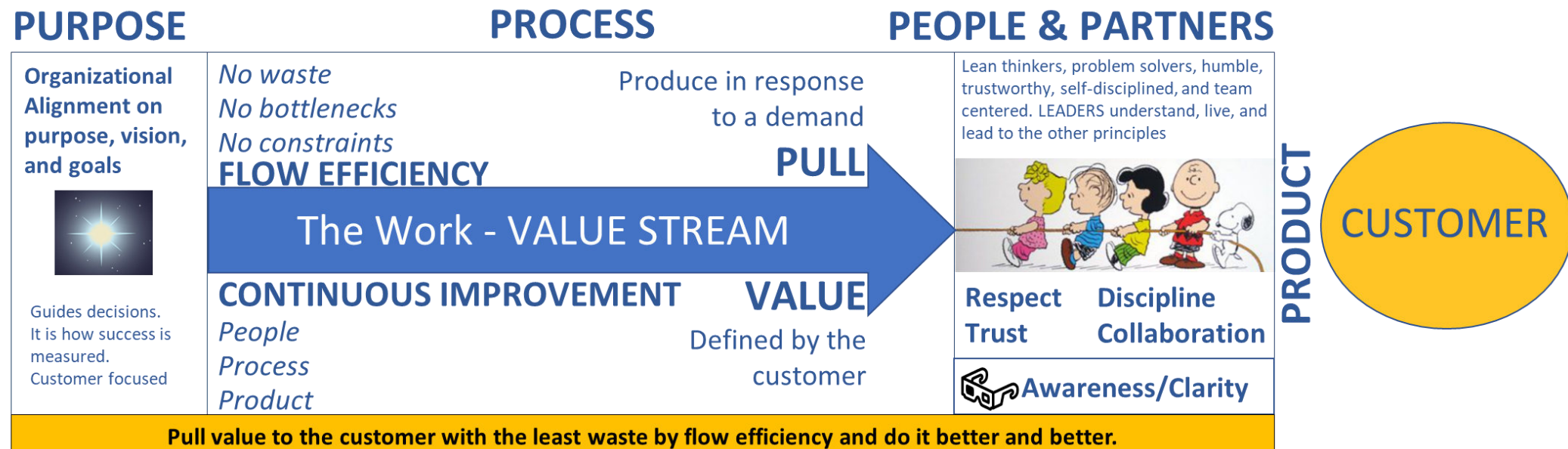
- Study Action Teams
- Visual Management
- Plus/Delta, Retrospectives
- Go-and-See
- Root Cause Analysis
- 5 Whys, Fishbone Diagrams
- A3 Thinking
- Direction/Strategy Mgmt.

- Last Planner System®**
- 5S** – Sort, Straighten, Shine, Standardize, Sustain
- Kanban**
- Integrated Project Delivery**  
Integrated Form of Agreement  
Big Room, Target Value Design, Set Based Design, Choose by Advantage
- Virtual Design, Visualization**
- Kitting, Prefab, Modular**

Quality at the source  
Solve at the lowest level  
Optimize the whole  
Continuous, one-piece flow  
See when flow stops  
Stop and fix the problem  
Just-in-Time  
Last Responsible Moment

# What is a Lean Organization? – Key Takeaways

- Lean organizations support lean projects
- Aligned on purpose
- Customer centered
- Leaders understand lean principles and design systems built on those principles
- Manage by value stream. Pull value. Make work flow efficiently.
- Build behaviors that create a culture of Lean Thinkers
- Continuously improving





# Creating your Lean Strategy & Roadmap

*...where we are going and how to get there*



# Creating your Lean Strategy & Roadmap – Key Takeaways

- Create a Lean operations strategy in support of long-term business goals – Always answer “Why?”
- Learn about Lean principles and practice. Study examples of others. But make it your own.
- Create your roadmap – Identify achievable milestones and a timeline of steps to get there.
- Carefully select methods and tools that support the overall goals.
- Make sure your organization has the attributes, resources, and leadership to support the plan
- Don’t make it overly detailed. Expect it to change.
- Get started. It will help you see things more clearly.

Develop  
Strategy  
and  
Roadmap



North  
Star



# What is a “lean strategy”?

**BUSINESS STRATEGY** sets the direction: What is our long-term vision? What markets do we serve? What value do we provide to our customers? What differentiates us in the marketplace?

**OPERATIONS STRATEGY** is focused on: How will you produce value? A **Lean strategy** is to do it as a continuously improving flow efficient organization. It must always connect with the business strategy.

**ROADMAP** is the plan on how you get there.

**JOURNEY** is the implementation of your roadmap.





# Business Strategy

What is our long-term vision?

What markets do we serve?

What value do we provide to our customers?

What differentiates us in the marketplace?



The **North Star** metric concept is best utilized by companies that invest in long-term sustainable growth. ... The value that you create for your customers drives the **strategic** direction for your company.

So... what is your North Star?

North  
Star

A bright, multi-pointed starburst graphic with a yellow center and white points, set against a dark blue background with small white stars.

# Operations Strategy

How will you produce value?

A Lean strategy is to do it as a continuously improving flow efficient organization.

It must always connect with the business strategy.

HOW DO WE DELIVER VALUE?



What will we look like when we fully live our Lean strategy?

North  
Star



# Developing YOUR Lean Strategy



The Starry Night – Vincent van Gogh 1889



Paint by Numbers for Adults - Framed Canvas and Wooden Easel Stand - DIY Full Set of Assorted Color Oil Painting Kit and Brush Accessories - Van Gogh The Starry Night 12"x16" Replica

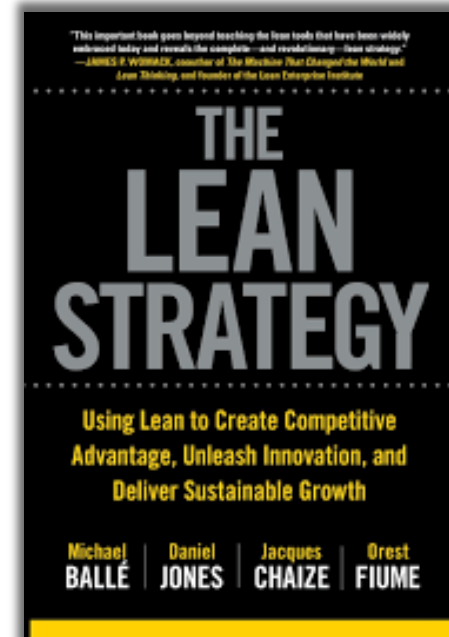
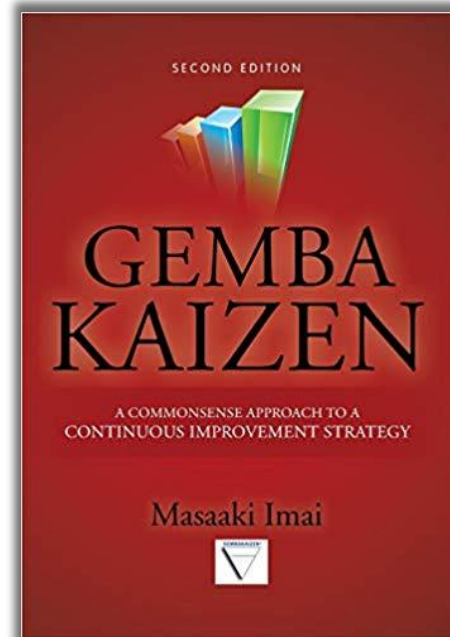
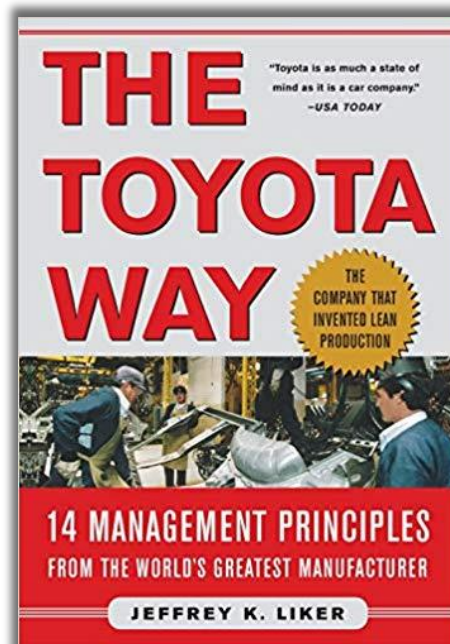
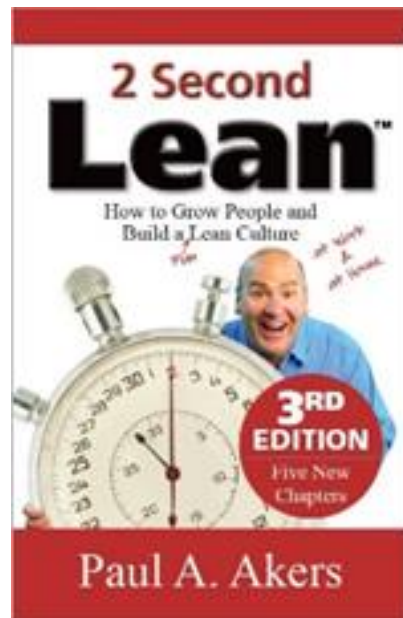


# Learn from others “Go and See”

While it is your strategy and your roadmap, there is much to be learned from other organizations and experts.

Understand the **underlying principles**. Why does it work? What doesn't work so well?

**Use what works for you.**



**Visit exemplary lean companies**

**Attend conferences**

**Help from Lean consultants**

# Creating Your Road Map – HOW DO WE GET THERE?

Start with the right question... What problem we are solving?

Close the **gap** between where we are now (current) and where we want to be (future)



Develop  
Strategy  
and  
Roadmap

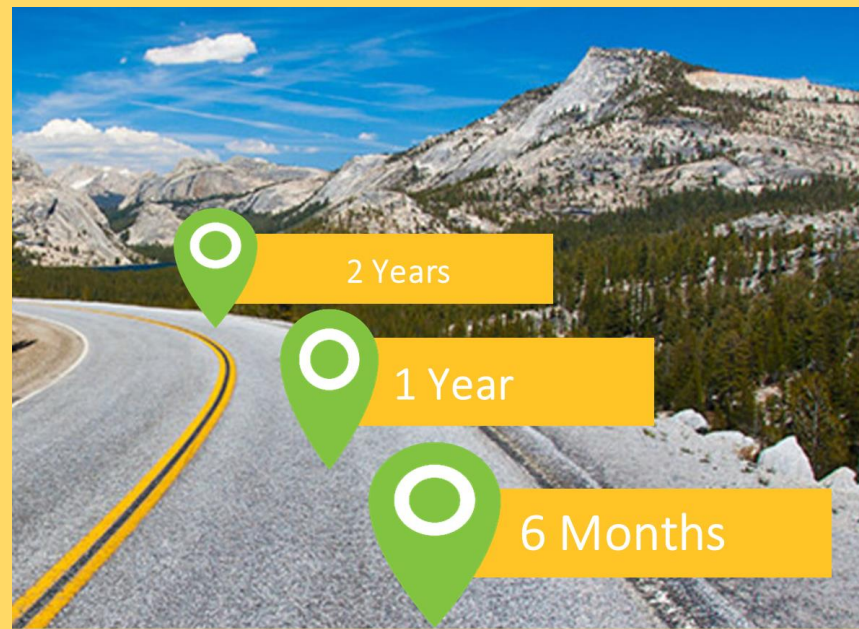


North  
Star



# Creating Your Road Map

- What can you reasonably accomplish?
- Level of leadership participation
- Resources available
- What lean methods do you already use and how is it going?
- Think long term



**This is a journey you can start without the whole plan**

- Get pointed in the right direction
- **Keep learning** so you can see the road ahead better
- Don't add more detail than you are ready to implement. It will change. Adjust as you go.
- Set progressive goals – Manage to milestones



# Set progressive goals – Manage to Milestones

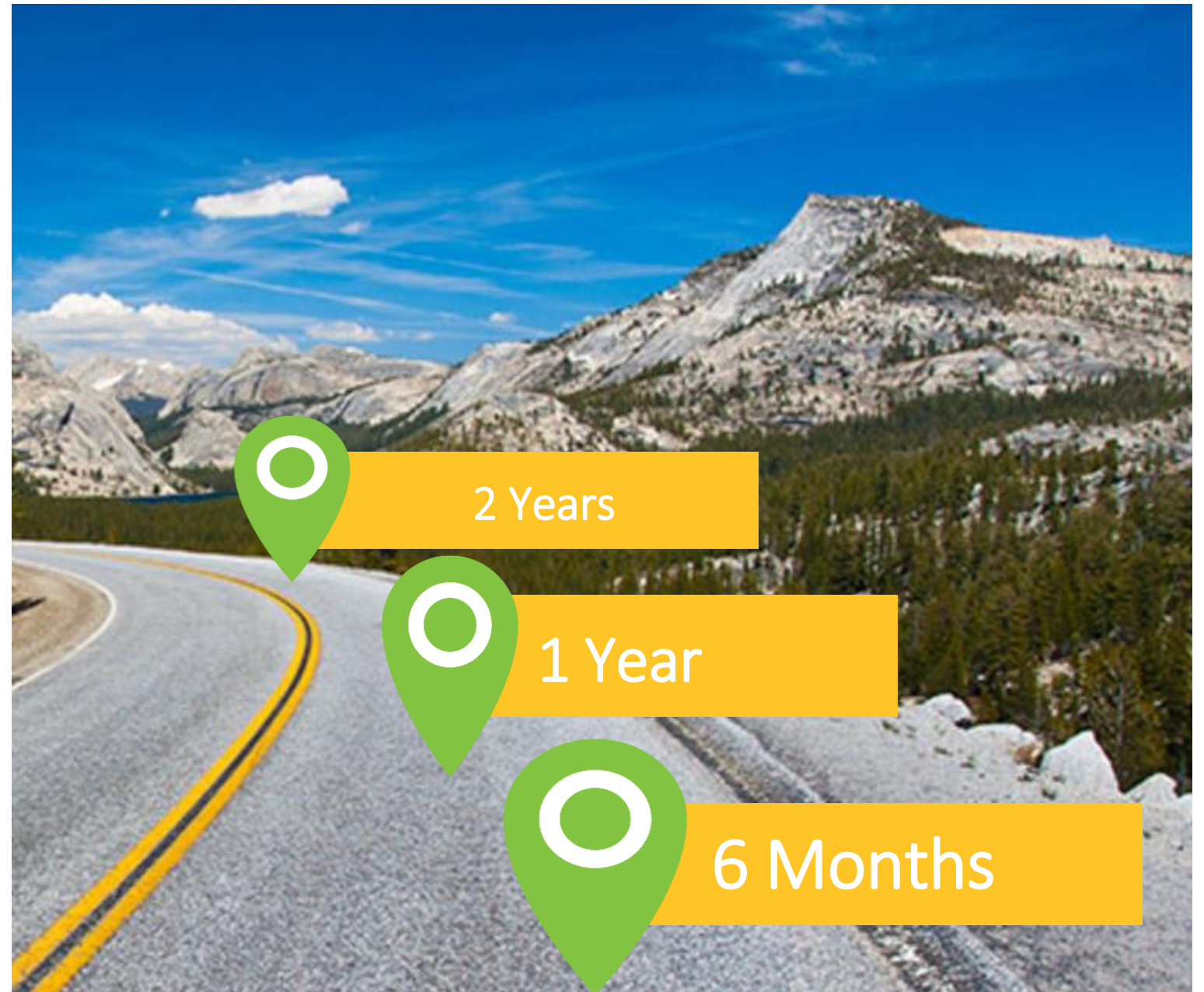
What will progressively build a lean organization with the least waste?

Set a foundation for growth

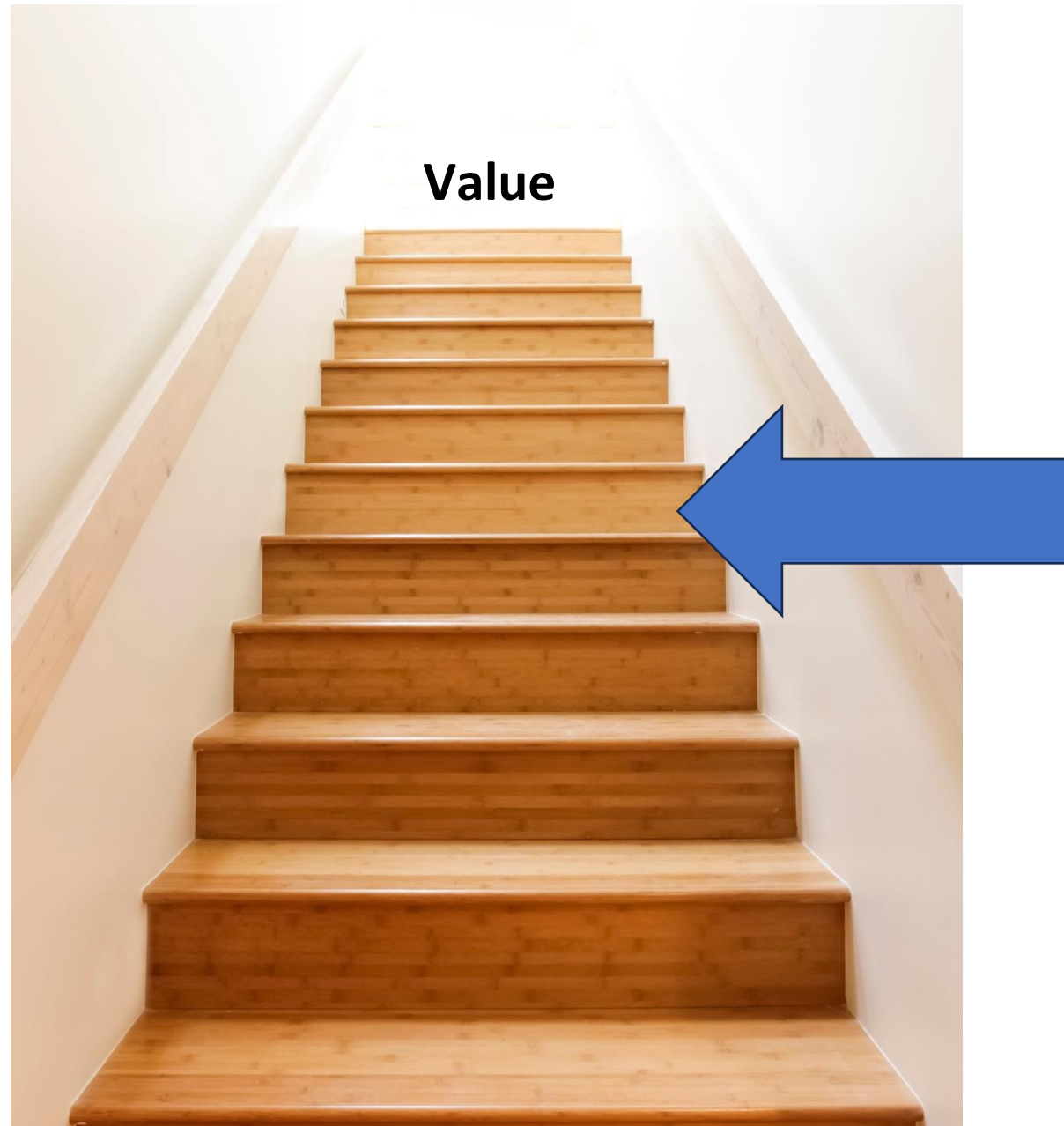
Cultural enablers

Build capacity

“Low hanging fruit” is short-term thinking unless it is part of a bigger plan



# Set progressive goals – Manage to Milestones



**Halfway up the stairs? What good is that?**


Focus on smaller goals that create value.

Example: Instead of a massive initiative to launch company-wide training and implementation, get one team/office/department started. Learn from it. Then expand.



# Gateways to Lean Behaviors – Some possible first steps...


Study Action Teams




Book club with a purpose

As a team or group learns together, they find practical ways to apply the learning to their work

Last Planner System



With good coaching, a team learning how to build respect, trust, and communication. They practice pull, focus on the value stream, achieving milestones, and removing waste



5S


Sort, Straighten, Shine, Standardize, Sustain

Learn to see and remove waste, discipline to follow through, while creating a safer, more productive workspace





Value Stream Map



Learn to manage by value stream, to see the whole and not just the parts, to recognize how work flows, to break down barriers between departments

Teams work together to see the current state, future state and build and implement a transformation plan to get there



1. Develop **People** who apply *Lean thinking* to their daily work
2. Provide a **System** (or process) to support them

POSSIBLE MILESTONES	WHY
5S is the way we work	Builds the foundation of a continuous improvement system
Study Action Teams	Learn together, Work on improvements together
Basic Lean Training for Everyone	Exposes organization to the concepts they will need Gets everyone speaking the same language
Develop Lean Champions	They are the mechanics for the race car Builds capacity to speed change
Build improvement processes on a project team	Gain experience and others see what can be done
Last Planner System on all projects	LPS touches almost everything we do. It exposes a large proportion of staff to Lean thinking. Becomes a gateway to other Lean practices
Value Stream Map implemented on a value stream	Builds flow thinking. Brings together multiple departments.
What are you already doing? Do it better.	Helps staff see what is possible. That Lean is for real.

# What is your lean strategy? (future state)

**Write a description of what lean will look like at your organization? (10 minutes)**

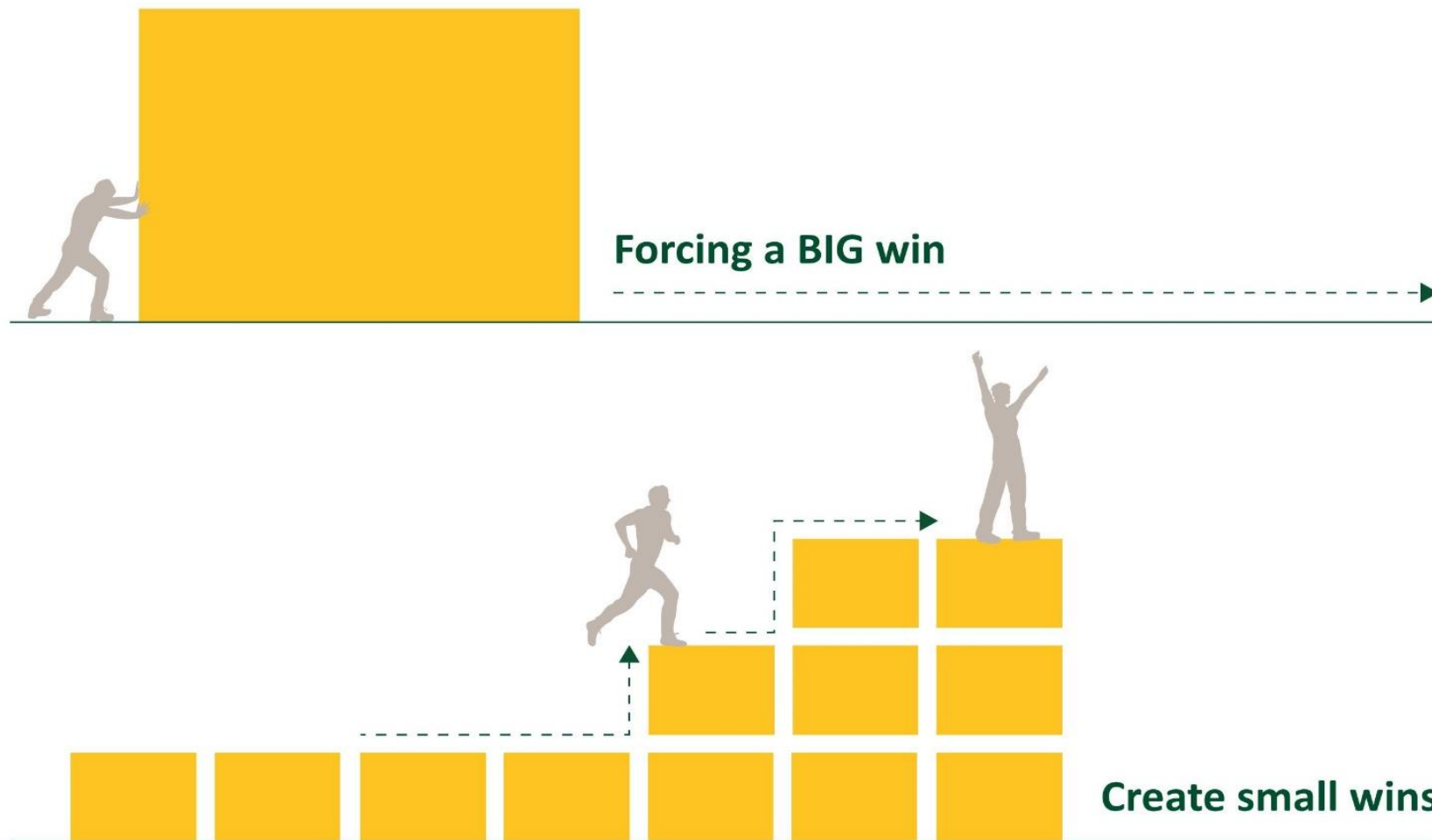
- Do we have a “purpose”? A business strategy? Are we customer centered?
- What are our value streams? What would “flow efficiency” look like?
- What will we all need to know to be a culture of “lean thinkers”?
- What lean methods and tools especially relate to our business?



**You cannot do this in 10 minutes. This is only an exercise to get thinking about possibilities.**

# Creating Your Road Map – HOW DO WE GET THERE?

How do we close the **gap** between where we are now (current) and where we want to be (future)



Step by step patiently  
build a Lean culture

- Don't try to force a big win.
- Fix one thing at a time.
- Small batches. There is more value in finishing something.
- Improve with each step



# Implementing the Plan

*...your lean journey*



# Journey

Implement the plan. Live it.

Remember: Check and adjust as you go. It will change. Always keep learning.

**Live  
the  
plan**



**North  
Star**



# Keys to Success & Pitfalls to Avoid

Have you struggled with your lean program?

Share with the group...

What has been your experience?

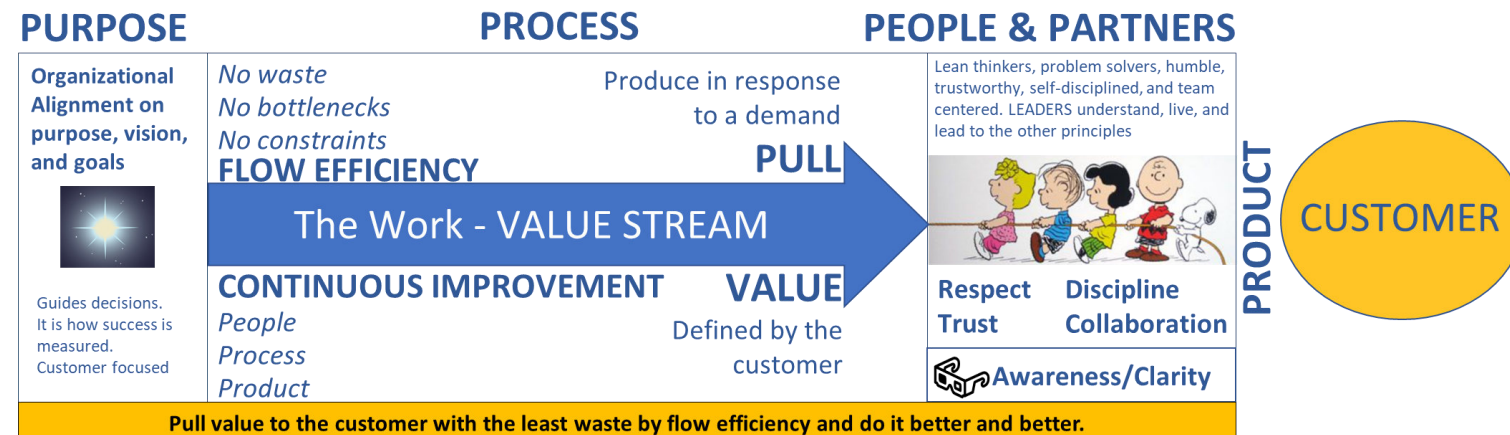
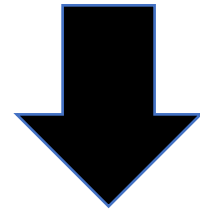
What do you think is the reason?





# Why do many Lean programs fail?

They don't manage to this

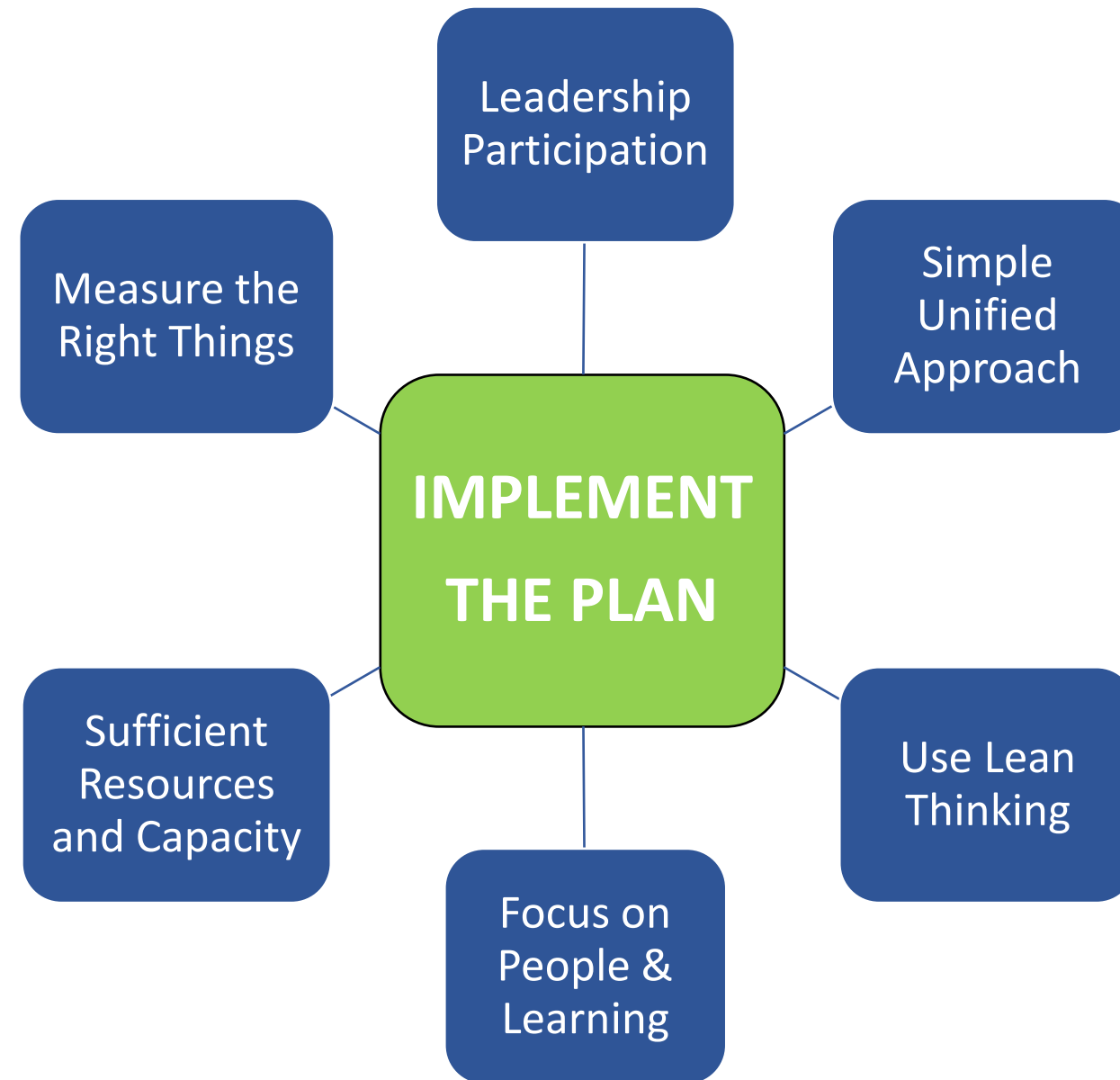


## A lean organization

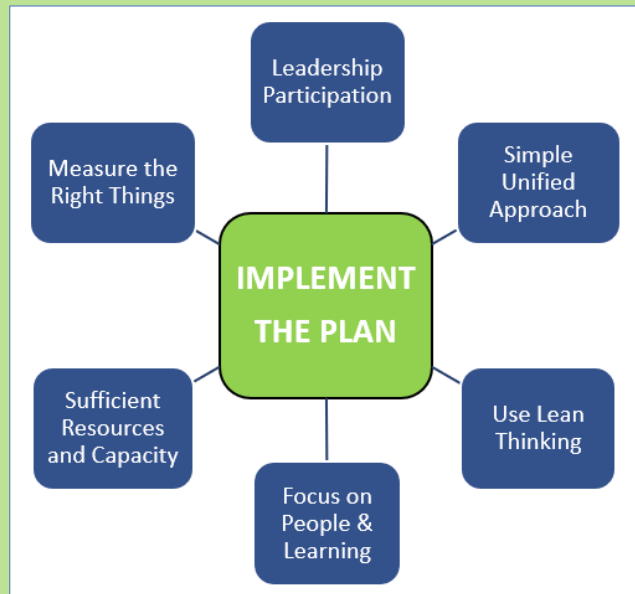


Like ice melting in a drink, gradually, Lean is no longer an initiative. It is the way you work.

# Implementing the Plan – Keys to Success



# Can you really expect a Lean Culture without a key part of the team participating?



Leadership Participation

- Why is leadership participation so important?
- What is the difference between support and participation?
- Why might leaders struggle to fully embrace change?
- How do you gain leadership participation?





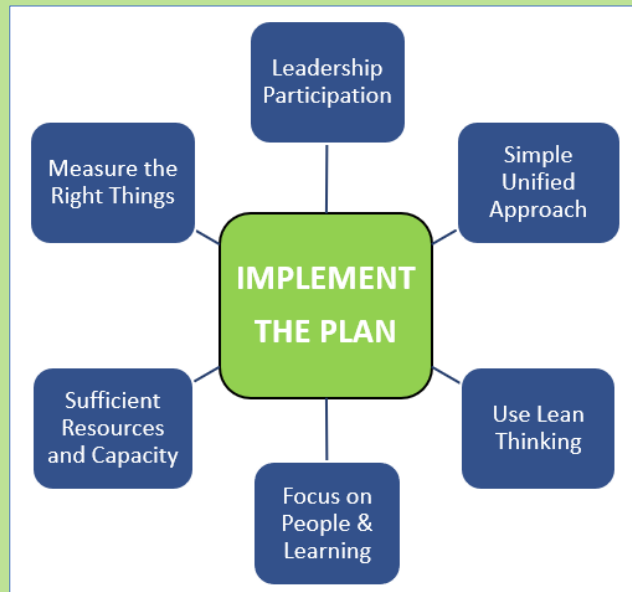
# What if my leadership isn't on board?

Gradual	Limited	Personal	Nothing
Implement locally. Gradually draw others. Get the attention of management. It is slow, but sometimes works.	Set your sights lower. Just your department or project team.	Do what you can. If nothing else, you will get more satisfaction out of your work.	Do nothing.

Who is the customer of our lean program



**Our organization and the people who make it up**



Use Lean Thinking



**Pull value by delivering the right things at the right time**

Instead of global initiatives, deliver training/coaching when you get most value

# **PULL VALUE, DON'T PUSH**

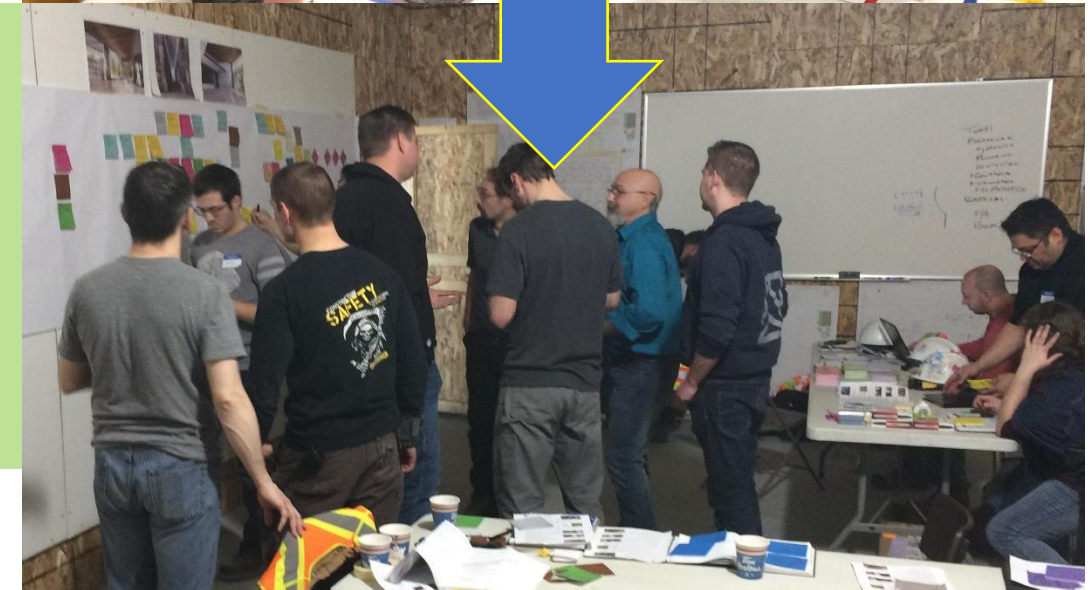
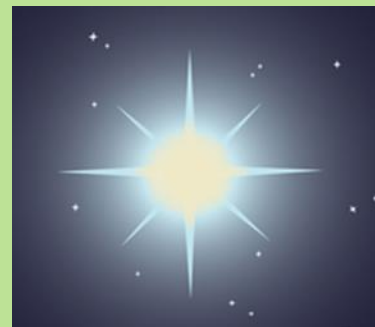
**Instead of global initiatives, focus on just-in-time  
when people want it, can use it**

Deliver training/coaching when get most value

Tightly couple learning with doing

**Always answer “Why”**

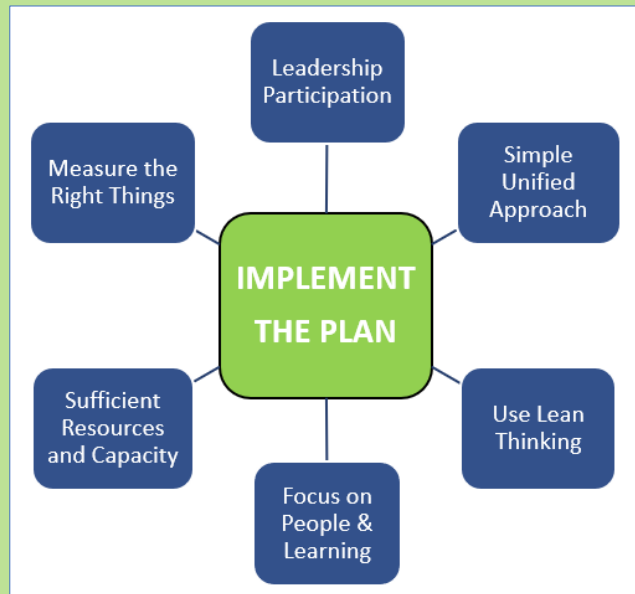
Is this the right time? The right tool?  
The right way to build awareness,  
understanding, competency?





Don't become a "program" that creates **waste** or adds **burden**.

- Avoid unnecessary bureaucracy.
- Don't add without removing.



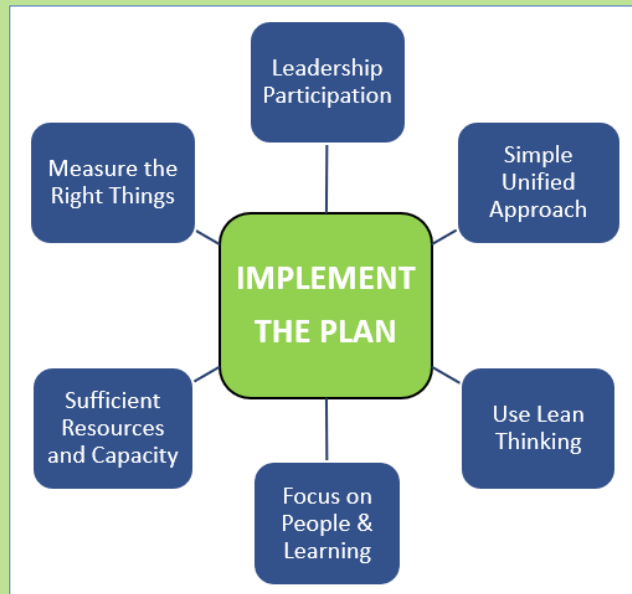
Use Lean Thinking



**Don't become waste yourself**  
**Ask "What value are we delivering?"**

2013. SESAME WORKSHOP. ALL RIGHTS RESERVED

# Lean is Simple – Keep it that way



Simple  
Unified  
Approach

**People  
have  
enough  
to do  
already.  
Do not  
make this  
difficult  
or a  
burden.**

---

Simple, understandable,  
repeatable

---

---

Linked to business strategy

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---

Same basic training applies  
to everyone

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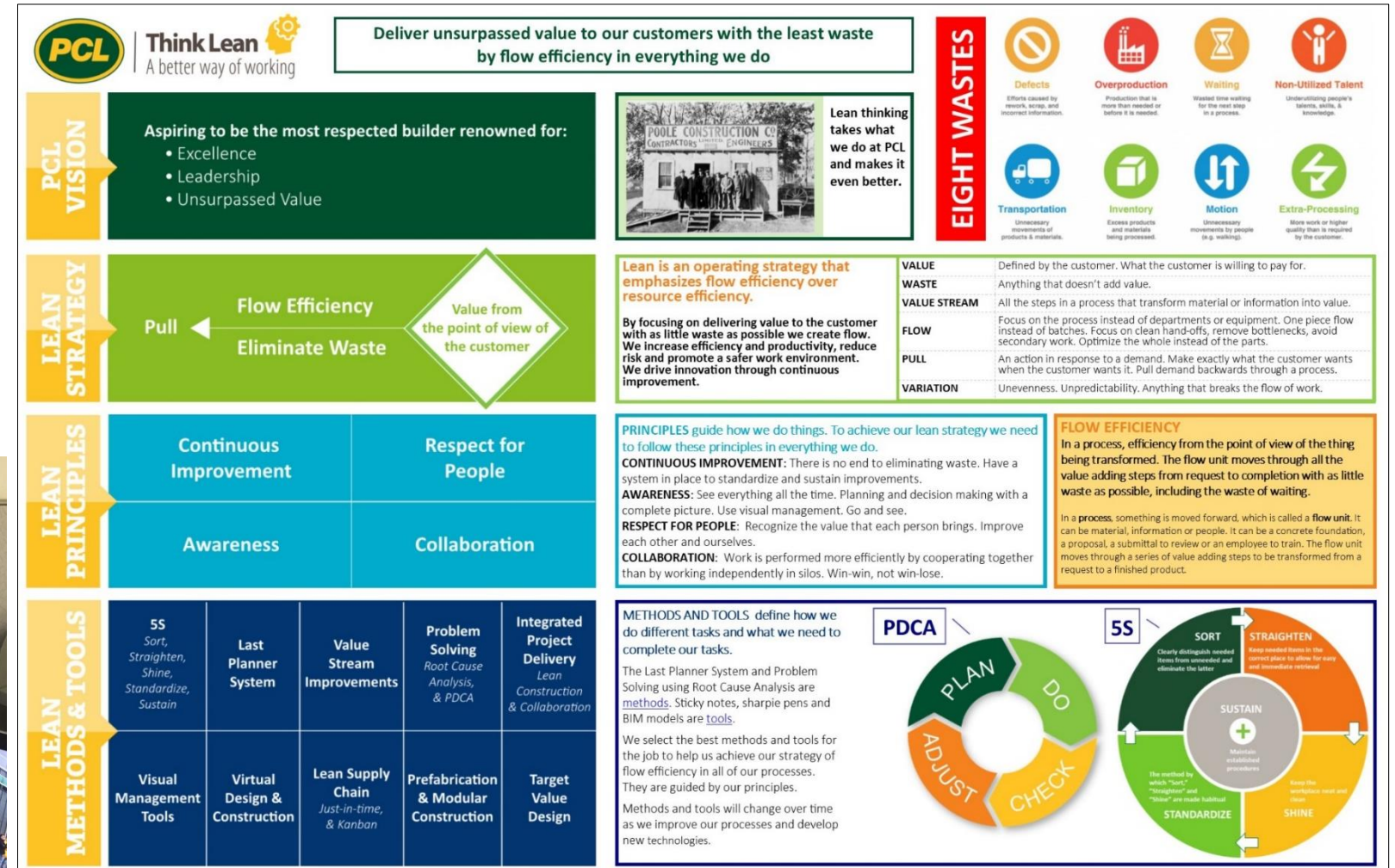
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All training/tools tie back  
to principles and strategy

---



- Same basic training for everyone.
  - Create a common standard language
  - Always explain “Why”
  - Visual
  - Foundation for everything you do
- # Consistent, Simple, Clear



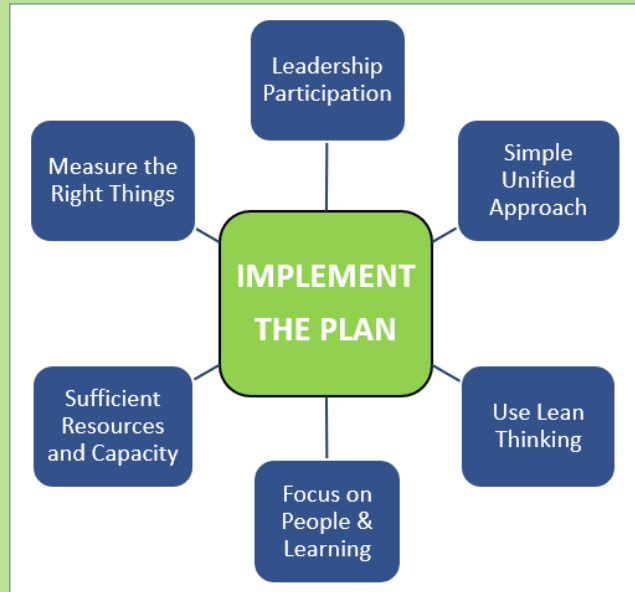
Courtesy PCL Construction



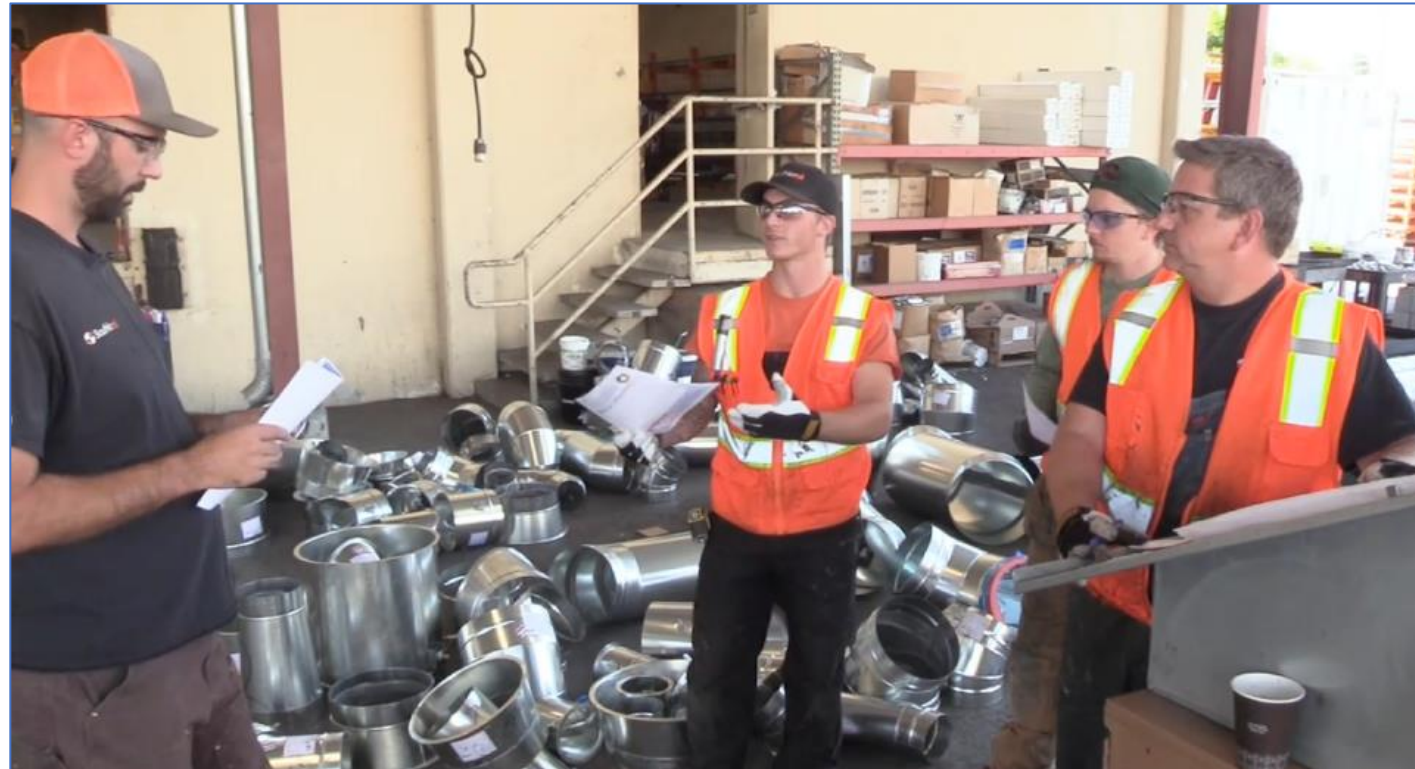
# Learning by doing

Recognize the difference between training and learning.

Your goal is learning. Find the best ways to achieve the goal.



Focus on  
People &  
Learning



A foreman meets with a crew to discuss how to improve the flow of work using a 5S assessment

***Gateways to Lean Behaviors***

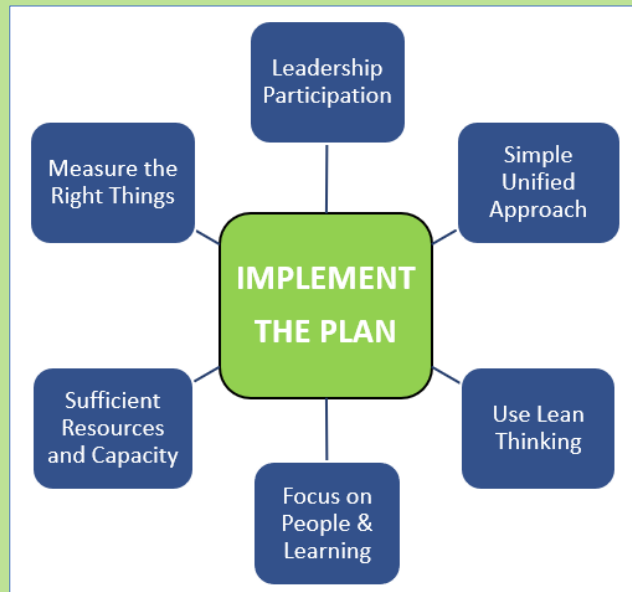
## Build capacity to help your people grow

Develop from within people who know the business

External coaches used to develop internal trainers and coaches

Dedicated local Lean Managers, Promote Lean Manager as a career

Grow champions who can teach others



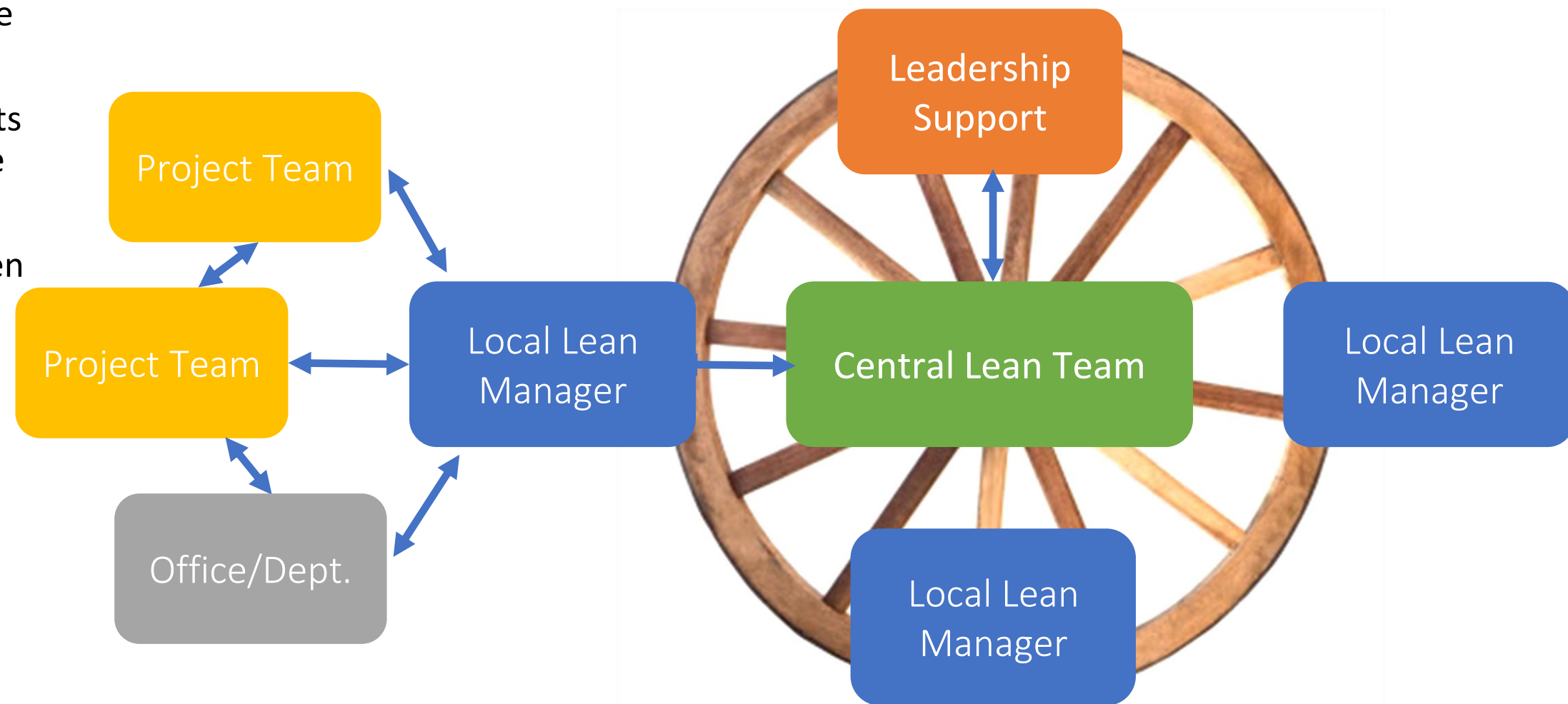
Sufficient  
Resources &  
Capacity



***Do not create bottlenecks that slow your journey***

# Collaborate Across the Enterprise

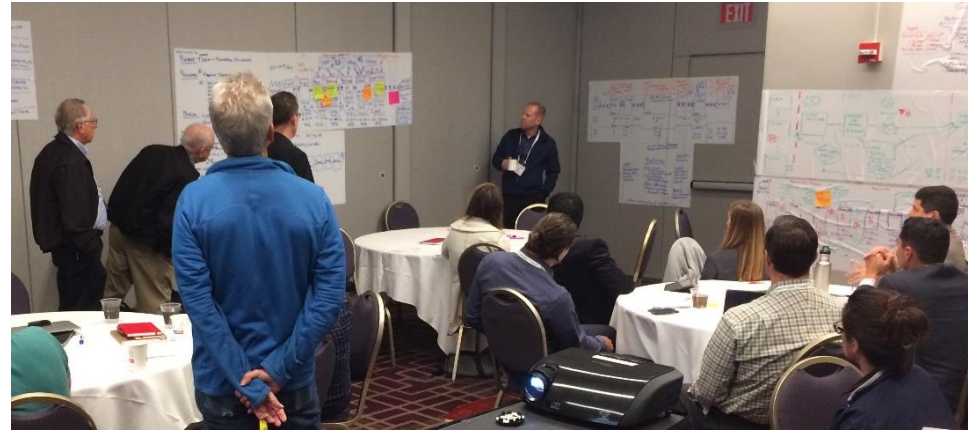
- Central Lean Team provides structure, tools, and links everyone
- Dedicated local lean managers are close to the people and the work
- Project teams and departments grow champions, who become future lean leaders
- Communication grows between teams and offices and work becomes standardized for collaborative improvement





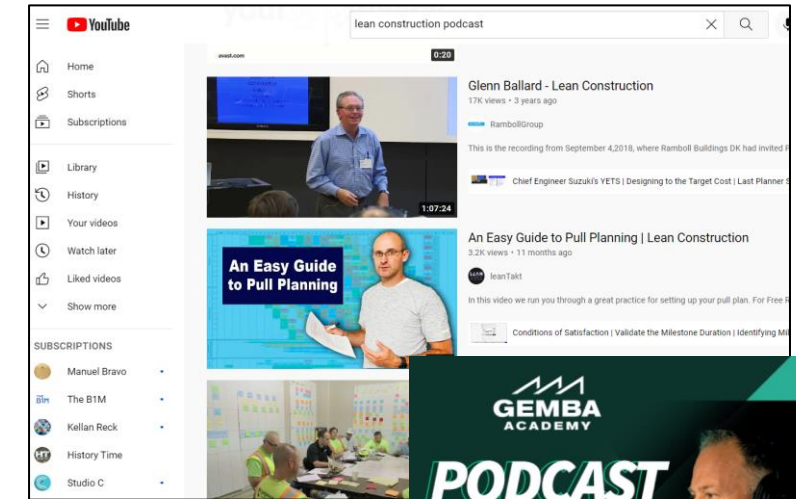
# Build the capacity to teach others and lead change

## Study Action Team for Lean Managers and Champions



## Keep Learning

Attend conferences and training  
LCI Congress  
LCI Community of Practice  
Lean Construction Blog  
Lean Podcasts  
YouTube  
Read books



Dedicated staff and a collaborative process prevents “reinventing the wheel” and leads to standardization that can be shared across the enterprise.

LEARN



Learning Value Stream Mapping at LCI Congress

IMPROVE



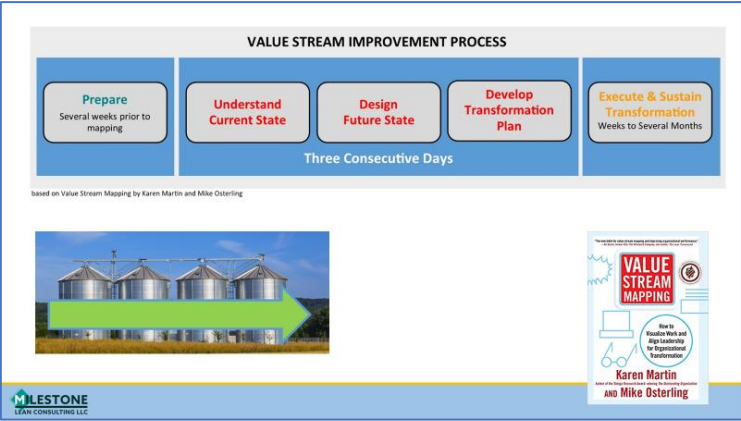
Working with a team to practice what was learned

SHARE



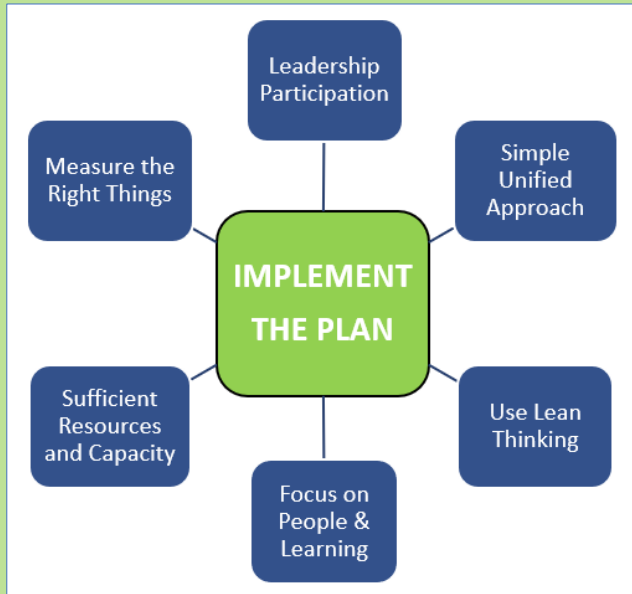
Another team applies what was shared.

STANDARD



A standard is developed from the experience.





Why do we measure?  
What do we do with the information?



Measure the  
Right Things

Measure Performance  
(KPI)



Measure Behaviors  
(KBI)

To assess progress in real time  
Guide decision making  
Encourage right behavior  
Learn and adjust as needed



# Measure What?

Measure Performance  
(KPI)



Measure Behaviors  
(KBI)

Be careful what you  
measure  
Because that is what  
you will get



**Example: Measure against a milestone on our roadmap...**  
**“Use the Last Planner System on all our projects”**

**What about it do we measure?**  
**Why did we set the milestone?**  
**How does it help us achieve our vision?**

**Is our goal to have every team “do” the Last Planner System?**

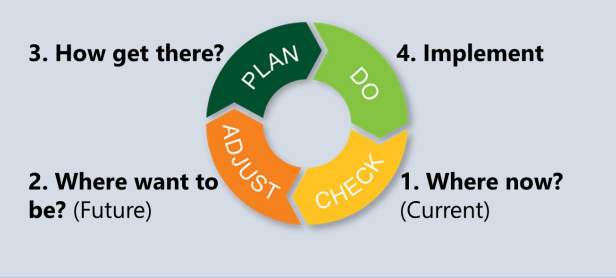
**In your breakout...**

Take five minutes and discuss what to  
measure. Report back with the best  
measurements and why.



# EXERCISE: HOW DO WE REACH THAT GOAL?

## Our goal in 2 years is “Last Planner System the way we plan”



Use lean thinking to work with your group to come up with a transformation plan (10 minutes)

1. Design the best process you can
2. Document the process (Standard Work)
3. Continuously improve (Kaizen)

Let’s assume... you have several projects that have used LPS with some success. But you feel that you are not getting the results that you could, and it is hit and miss across your projects. How can we make LPS the way we plan consistently and effectively?

**Check** – Where are we now? Why only marginal success?

**Adjust** – Design the best process we can. Standard. What will it look like if we reach our goal. How will we know? Measure of success? What is not included? (Can wait until the next goal)

**Plan** – How will we implement the change? What resources will we need? Who will be responsible? Possible obstacles? How will we sustain the change?



# Implementing the Plan – Keys Takeaways

**Leaders are participants**

**Keep it simple**

**Use the same Lean thinking to implement the roadmap that you are trying to build into your organization. You will get much better results.**

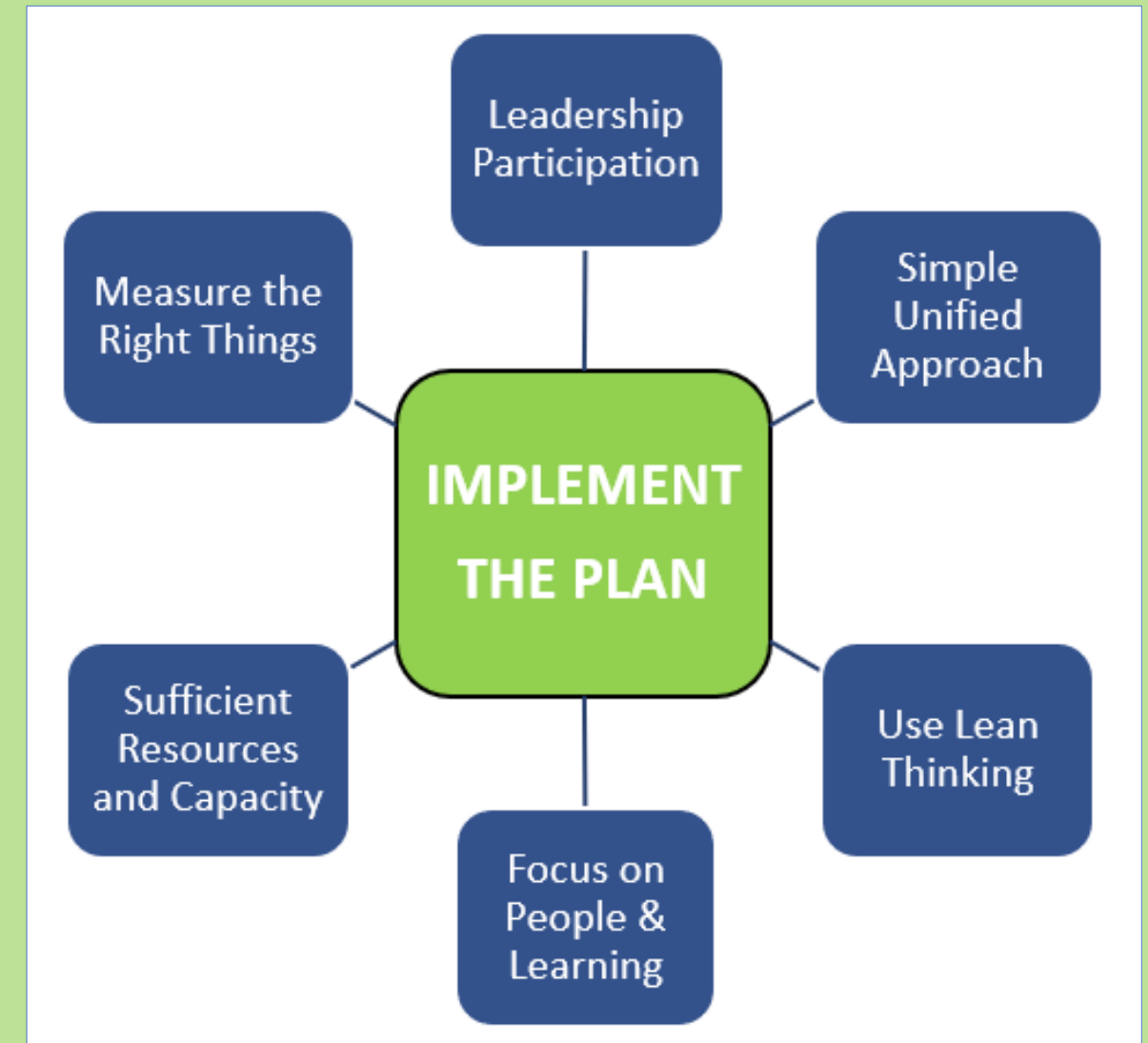
**Create a common standard for lean that can apply across the enterprise**

**Tightly couple learning with doing and learning by doing**

**Get expert help and build capacity in local Lean leaders**

**Never lose sight of your “North Star”. Set milestones that progressively help you achieve your Lean Strategy.  
Measure to those milestones**

**It’s a long journey, but each step brings better results**





# Managing & Sustaining your Lean Organization

*...this is who we are*



# Managing & Sustaining

Patiently keep building

Grow Lean Leadership

Manage to Key Behaviors

Manage by value streams

Develop Lean Thinkers

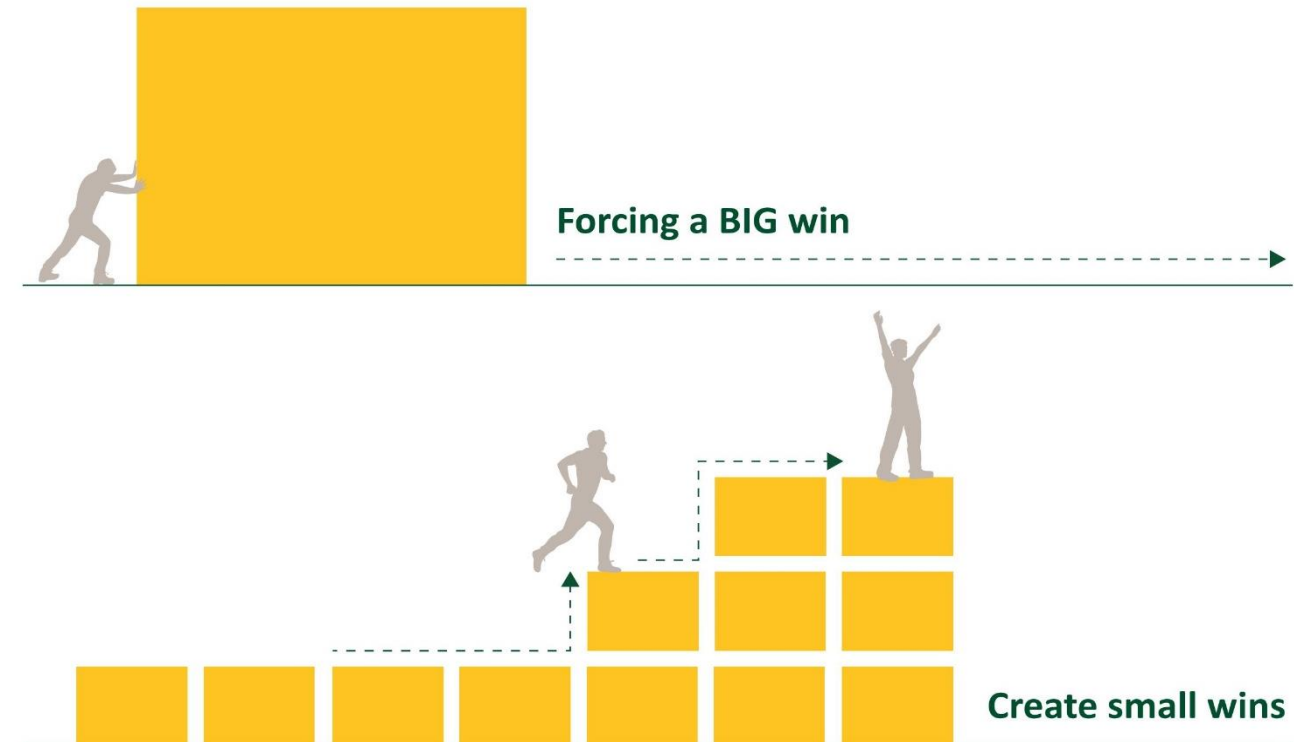
Continuously improve

- Don't try to force a big win.
- Fix one thing at a time.
- Focus on what you can change
- Small batches. There is more value in finishing something.
- Improve with each step

**Manage and Sustain starts from the very first step.**

Step by step  
patiently build a  
Lean culture

Power of small wins...



# Managing & Sustaining

Patiently keep building

Grow Lean Leadership

Manage to Key Behaviors

Manage by value streams

Develop Lean Thinkers

Continuously improve

1. Develop **People** who apply *Lean thinking* to their daily work
2. Provide a **System** (or process) to support them

A Lean transformation requires...  
**a personal transformation at the leadership level about how to think about solving problems**

**You can't manage what you don't understand.  
You can't lead what you don't live**



## Leader Standard Work

- Learn as much as you can
- Learn to be a teacher/coach
- Role model lean principles
- Strategy Deployment
- Promote clarity and alignment
- Manage value streams
- Enable employees in the flow to improve the flow

## Lean Leaders Grow by...

**Participate in creating and living the roadmap**  
**Be involved and understand lean tools**  
**Be humble, accept that you can improve**



# Managing & Sustaining

Patiently keep building

Grow Lean Leadership

Manage by Key Behaviors

Manage by value streams

Develop Lean Thinkers

Continuously improve

1. Develop **People** who apply *Lean thinking* to their daily work
2. Provide a **System** (or process) to support them

**People and Process are interrelated. You need both. Together.**

# Managing & Sustaining

Patiently keep building

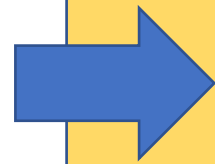
Grow Lean Leadership

Manage by Key Behaviors

Manage by value streams

Develop Lean Thinkers

Continuously improve



1. Develop **People** who apply *Lean thinking* to their daily work
2. Provide a **System** (or process) to support them

**Hire the best people you can**

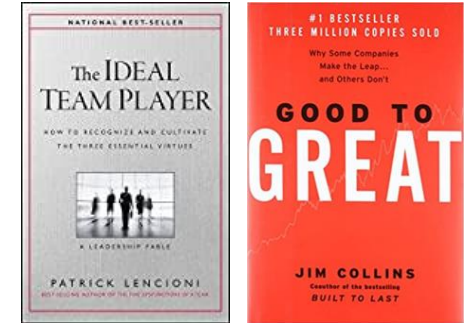
**Train, equip, and help them to succeed**

**Show appreciation, celebrate success**

**Develop a standard for hiring  
Document the process for hiring to ensure the standard is met**

**Onboarding process that includes training in job competency and lean thinking ...that is just the start. Show “respect for people”**

**People thrive when they are recognized for their contributions.  
We all want to be needed.**



**What should you look for in the people you hire? How will they help achieve they operating strategy?**

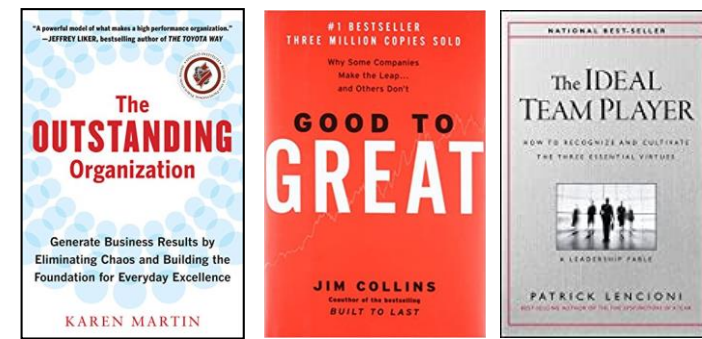
# What is a “Lean Culture”?

**Culture:** the aggregate of people’s behaviors





# 11 Attributes of an Organization



**PURPOSE** of the organization. An understanding of who you are, why you exist. Your vision, mission, guiding principles. Customer focused. It guides goals and decisions. It is how success is measured. Alignment – Understood and practiced by everyone.

**PRODUCT** what you produce and deliver. From the point of view of the customer it is why you exist. It is value from the point of view of the customer. It is what differentiates you. How is your product viewed by your existing and potential customers.

**PEOPLE** with thinking ability, who are trustworthy, humble, self-disciplined and team centered. There is no need to motivate the right people.

**LEADERS** who are capable, humble, ambitious for a purpose beyond themselves. They understand, live, and lead to the other principles.

**RESPECT** is how you treat other people. Recognizes the value that each person brings. The human spirit thrives under appreciation and trust. It is critical for collaboration and improvement.

**TRUST** is based in people who are trustworthy because they are honest, capable, and reliable. It is earned. Organizational trust is built into policies and systems.

**AWARENESS**, which is to see everything all the time. It is seeing things as they really are. It is understanding “why”. It is the basis for good decisions. Clarity. Necessary for alignment.

**DISCIPLINE** of thought firmly based in reality. Focused action that follows through on a plan. Diligence

**COLLABORATION.** It is attributes of leadership, the right people, respect, and trust put to practice to accomplish more than could be achieved individually. It is aided by awareness and discipline.

**FLOW EFFICIENCY** relates to how to produce value. Work is pulled through all the value adding steps with the least waste. Organize and manage by process/value stream.

**CONTINUOUS IMPROVEMENT** as a fundamental mindset. It is proactive and process based. A learning organization . It uses lean thinking. Every member is problem solver and improvement generator.

**What makes an organization “lean” is the people and how they interact with each other and their work... to deliver value and make work flow efficiently**

# Managing & Sustaining

Patiently keep building

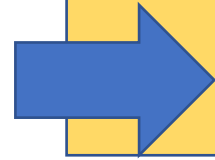
Grow Lean Leadership

Manage to Key Behaviors

Manage by value streams

Develop Lean Thinkers

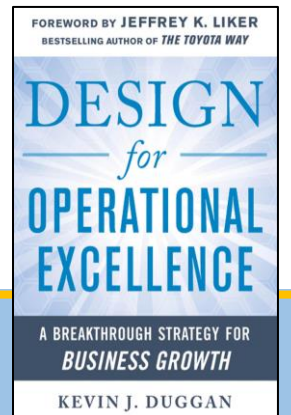
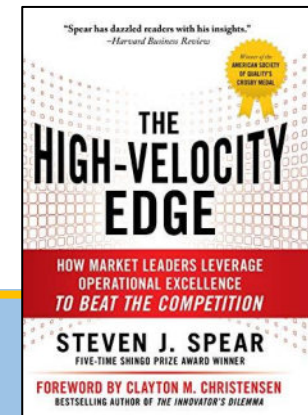
Continuously improve



1. Develop **People** who apply *Lean thinking* to their daily work
2. Provide a **System** (or process) to support them

1. Design the best process you can
2. Document the process (Standard Work)
3. Continuously improve the process (Kaizen)

- Simple, Visual, Easy to understand
- Someone responsible for the standard
- Train to it, Use it
- Guides behaviors

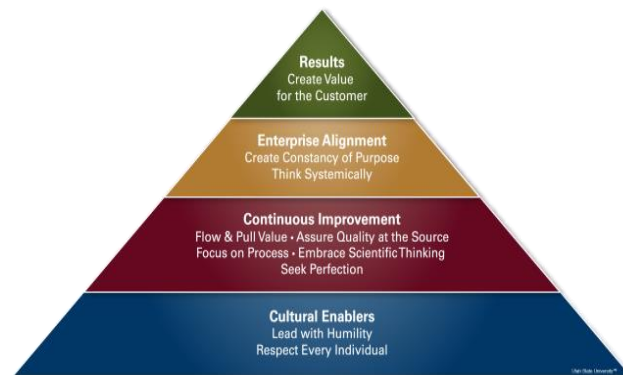


# A framework for Lean– Shingo Model





# Leading a Lean Organization – Shingo Model



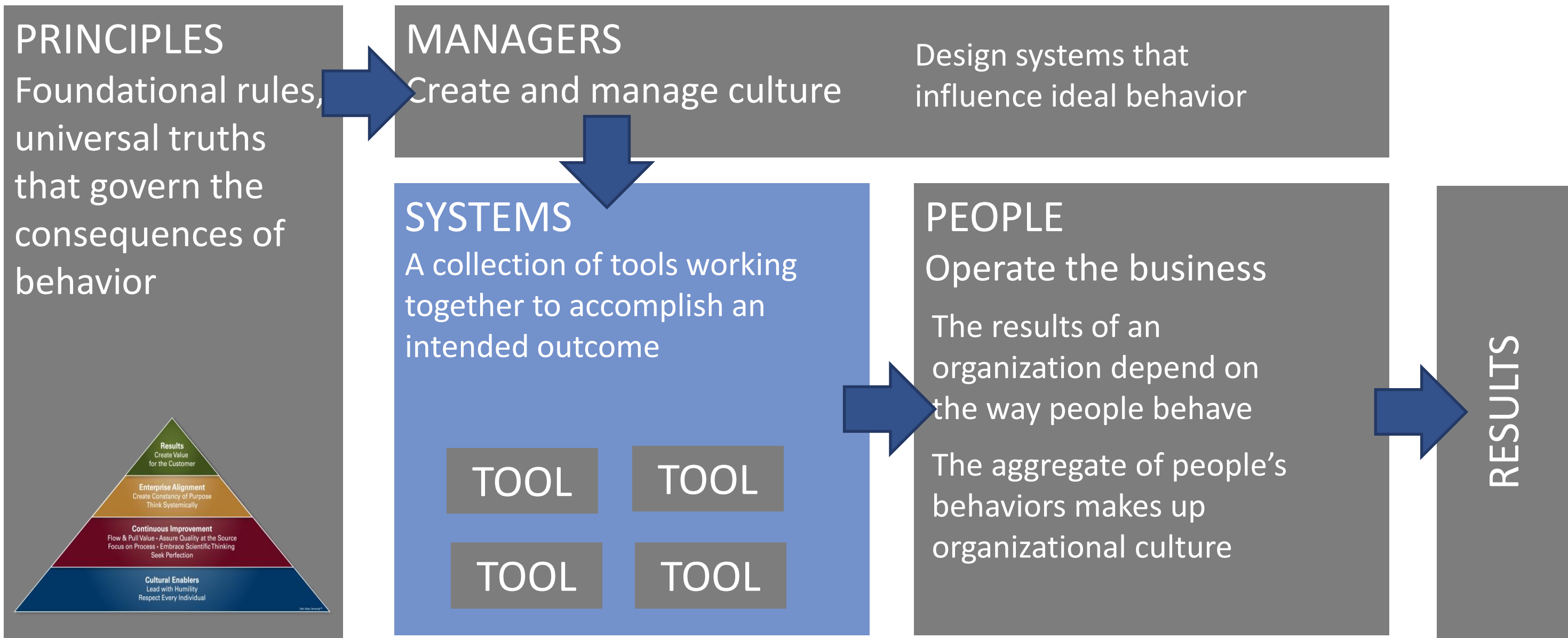
## RESULTS

A measurable outcome from implementation of tools and systems

*(e.g. higher ROI, customer satisfaction, faster turnaround, etc.)*

Sustainable excellent results requires the transformation of a culture to one where every single person is engaged every day in making small, and from time-to-time large, changes.

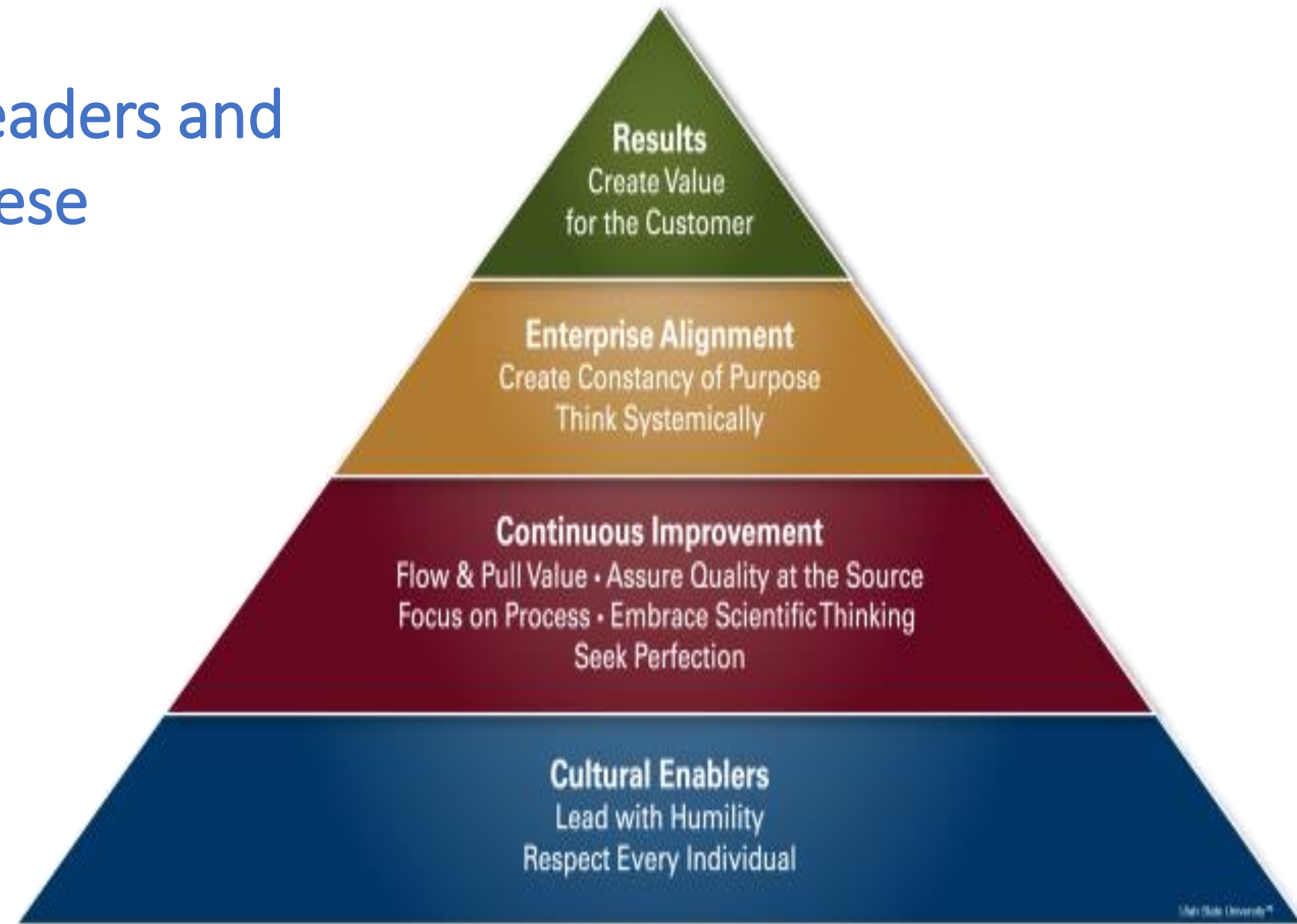
# Shingo Model: Results, Behavior and Guiding Principles



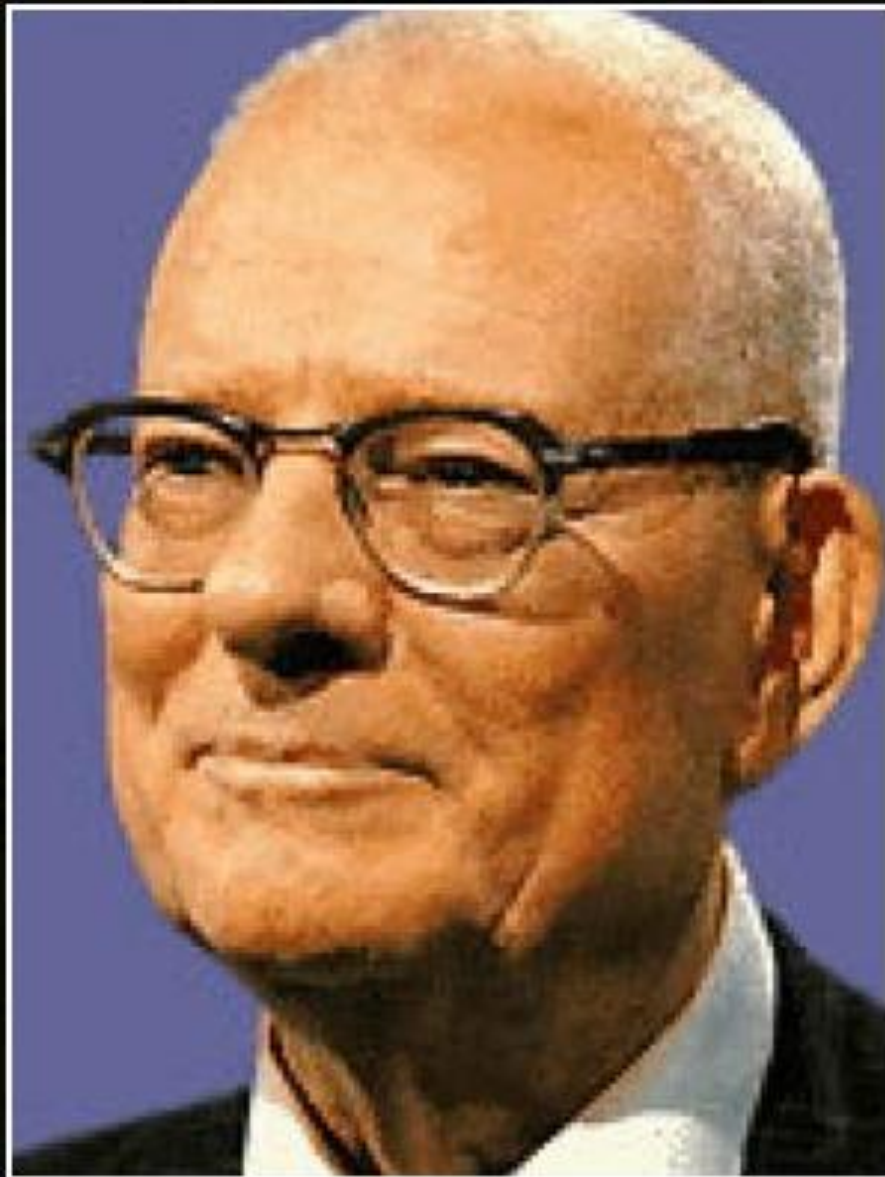
# Shingo Model: Guiding Principles

Can you have a lean culture if leaders and staff do not know and follow these principles?

LEADERS must understand and fully embrace these principles, and put them into practice







Eighty-five percent of the reasons for failure are deficiencies in the systems and process rather than the employee. The role of management is to change the process rather than badgering individuals to do better.

— *W. Edwards Deming* —

**AZ QUOTES**

Managing by...  
*Value stream, processes, and methods  
to be a continuously improving “learning organization”*





# Problem Solving

The gap between where you are (current) and where you want to be (future)

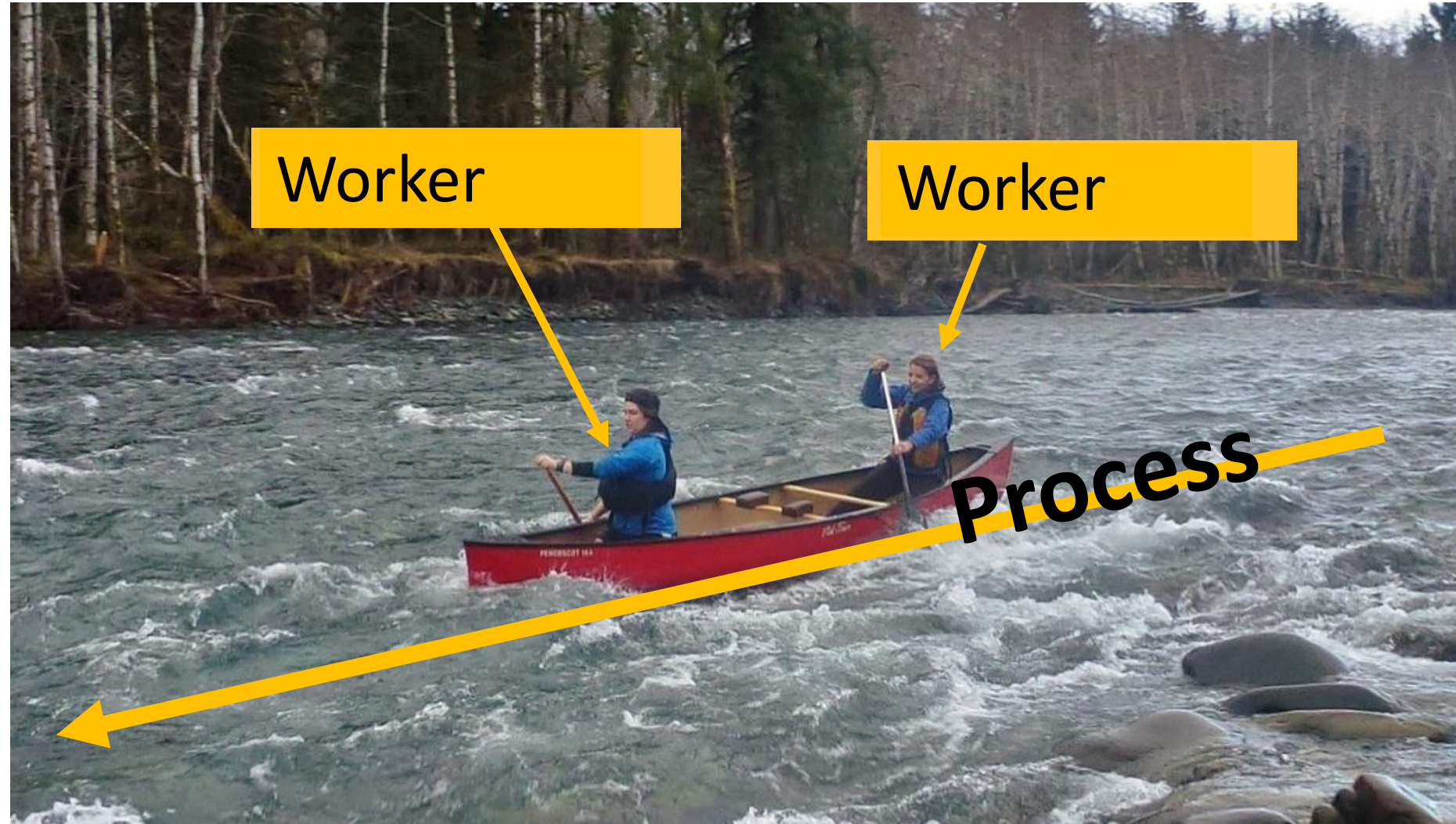
Problem solving – Closing the gap





# My Job = Doing the Work + Improving the Work

Respect for  
People



Used in the context of lean thinking, respect for people means we recognize the value each person brings and their potential to learn and grow.

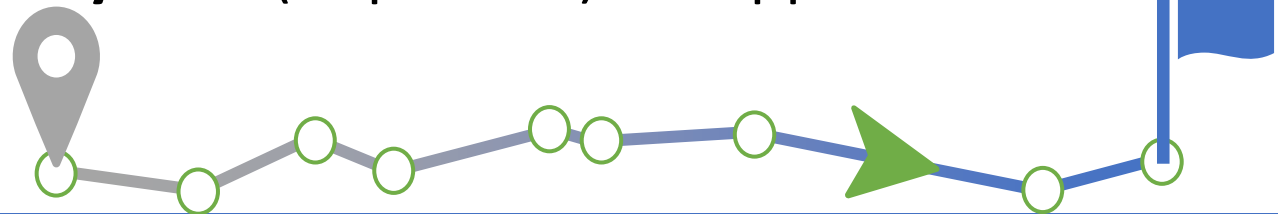
**But lean thinking does not come automatically**

# Problem Solving Principles and Tools

Read  
Fire  
Aim



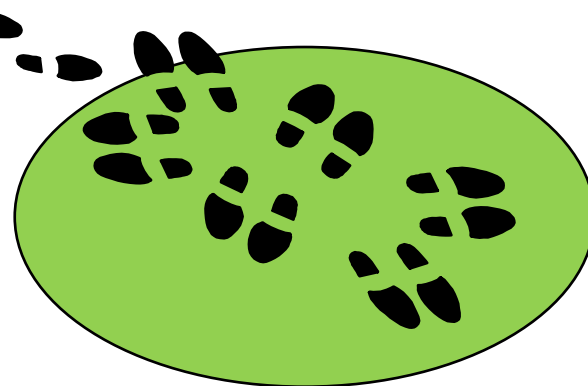
1. Develop **People** who apply *Lean thinking* to their daily work
2. Provide a **System** (or process) to support them



“Train the people doing the work to spot problems and then utilize their knowledge and skills to help improve the work” – *Steven Spear, The High-Velocity Edge*



Observation Walks  
“Go and See”



**Prevent future problems rather than just put out fires**

See problems in terms of process improvement  
Make visible – See when flow stops  
Error-proofing



# Problem Solving Principles and Tools

## Plus-Delta

### PLUS / DELTA

**Deliver unsurpassed value to our customers with the least waste by flow efficiency in everything we do**

**PCL VISION**

- Aspiring to be the most respected builder renowned for:
  - Excellence
  - Leadership
  - Unsurpassed Value

**LEAN STRATEGY**

Pull → Flow Efficiency → Value from the point of view of the customer ← Eliminate Waste

**LEAN PRINCIPLES**

Continuous Improvement	Respect for People
Awareness	Collaboration

**LEAN METHODS & TOOLS**

5S Sort, Straighten, Shine, Standardize, Sustain	Last Planner System	Value Stream Mapping	Problem Solving Root Cause Analysis, 8-POCC	Integrated Project Delivery Joint Venture Collaborations
Visual Management Tools	Virtual Design & Construction	Lean Supply Chain Just in Time & Kanban	Prefabrication & Modular Construction	Target Value Design

#### WHAT IS PLUS / DELTA?

Plus/Delta is a quick and simple group exercise to improve recurring meetings, planning sessions and other repetitive activities. It typically takes just 5-10 minutes to review and document what went well that the group should keep doing (Plus) and what didn't go so well that should be improved the next time (Delta).

#### WHY USE PLUS / DELTA?

Did you want to speak up but didn't know how or didn't feel it was safe to do so? Using Plus/Delta is an easy and safe way to talk about what's working and what's not and how to get better. Have you ever attended unproductive meetings where...

- The right people weren't in the room?
- The objectives or meeting process wasn't clear?
- People arrived late or didn't show up at all?
- Phone calls, emails and texts caused continual interruptions and distractions?
- Someone dominated the conversation, crowding others out?
- You didn't see value in attending the entire meeting but felt you had to stay?
- People didn't come prepared for the discussion?

#### WHY DOES PLUS / DELTA WORK?

It follows our Lean Principles...

**Respect for People** - Creates a safe space where everyone can be heard and contribute their ideas to improve the process and effectiveness. An issue that might be perceived as a negative is instead framed as a delta, a change to make the process better.

**Awareness** - Brings issues and ideas to the surface. Documenting and sharing gives all group members easy access to the information as a common point of reference and accountability.

**Collaboration** - Mutual respect for each other and awareness of Pluses and Deltas set the stage for group collaboration. Plus/Delta taps into the collective experience and wisdom to identify actions to improve their process. People are more likely to take personal ownership and accountability when they are involved and have a say.

**Continuous Improvement** - Incorporating a brief Plus/Delta as a regular part of a recurring agenda builds a sustainable process to get better and better.

#### USING PLUS/DELTA

- Add a 5-10 minute Plus/Delta session at the end of the agenda. (Include a brief description of the agenda item to prepare the group).
- Facilitate the Plus/Delta Session.
- Capture and send the Plus/Delta notes and actions to the group. Can be as simple as taking and sending a picture.
- At start of next meeting, review agreements and action status from previous Plus/Deltas to make sure improvements are followed through.
- This is an ongoing habit of Plan-Do-Check-Adjust to get more and more value with less waste.

#### FACILITATING A PLUS/DELTA

- Draw a large "T" on a whiteboard, flipchart or presentation slide. Label the top left with "Plus" and the top right with "Delta".
- Ask the group for...
  - Plus—What brought value that we should keep doing?
  - Delta—What can be changed to do different or better next time?
- Can be free form or group members taking turns. Encourage input from all participants.
- Pluses and Deltas should be framed as actions
- Clarify, Validate and Record Plus/Delta Actions
  - If not phrased as an action, clarify by asking:
    - So what should we keep doing? (Plus)
    - So what should we change? (Delta)
  - Use the group member's words when capturing the action. Ask to rephrase if too long
  - Check with group to see if most agree the action will bring value
- Identify Action Owners and Due Dates
  - Some items are simply group agreements or decisions
  - Other items may require someone to take action to implement

#### LINK TO PDCA

Plus/Delta is a quick and simple way to Check & Adjust our process to improve our recurring meetings and group activities.

**Plan.** Identify a problem and make a plan of action to improve.

**Do.** Implement the plan of action.

**Check.** Did the actions taken improve the process? (Plus). Things often don't go as planned or we may get additional unintended consequences from our process change. What should we do different? (Delta).

**Adjust.** Adjust the process and Check again.

Updated September 26, 2018 —Suggestions for improving this sheet are encouraged.

Reference: Transforming Design and Construction by the Lean Construction Institute

- Builds “Check/Adjust” thinking as a part of continually improving
- Very simple to learn
- Include follow-up (not just a list)
- Include at the end of meetings or a process such as jobsite clean-up
- Include in Last Planner System Weekly Work Planning

Courtesy PCL Construction



# Managing & Sustaining

Patiently keep building

Grow Lean Leadership

Manage by Key Behaviors

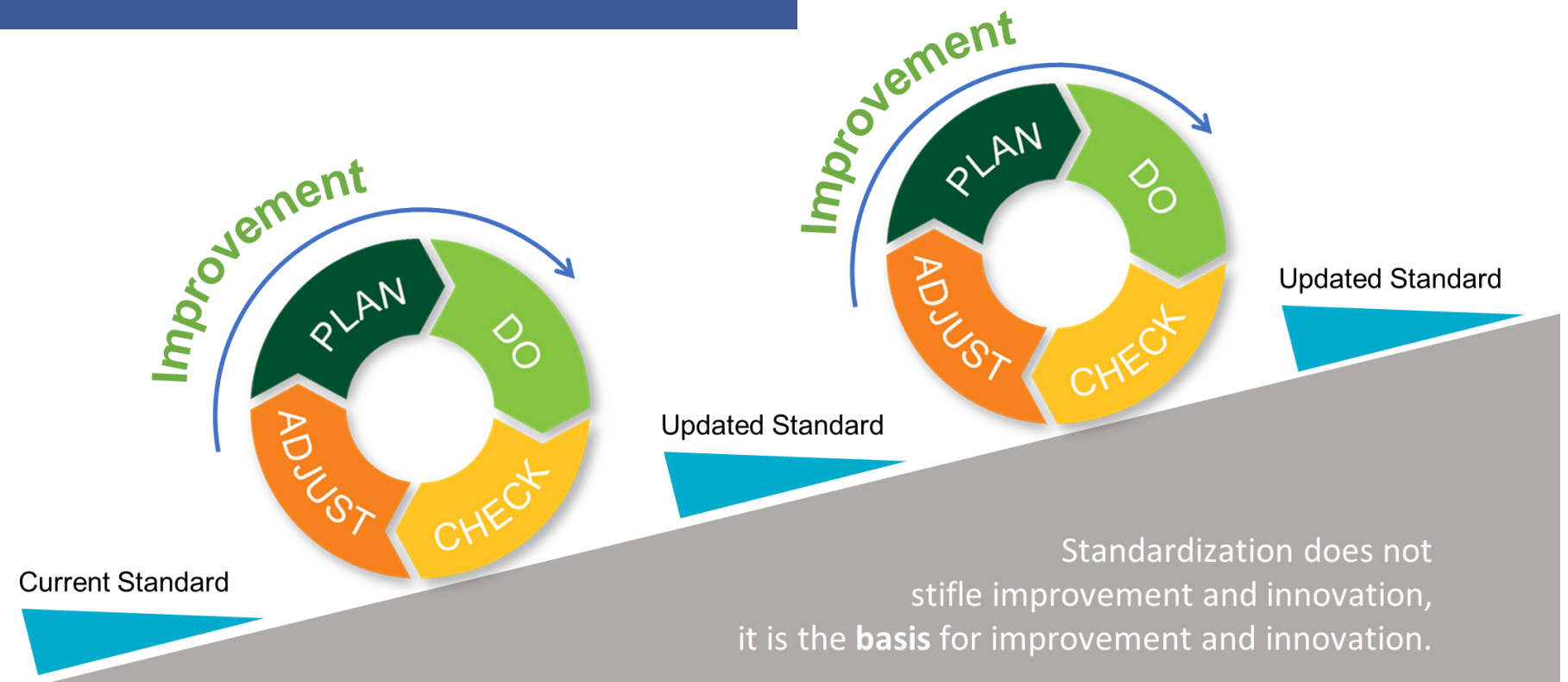
Manage to value streams

Develop Lean Thinkers

Continuously improve

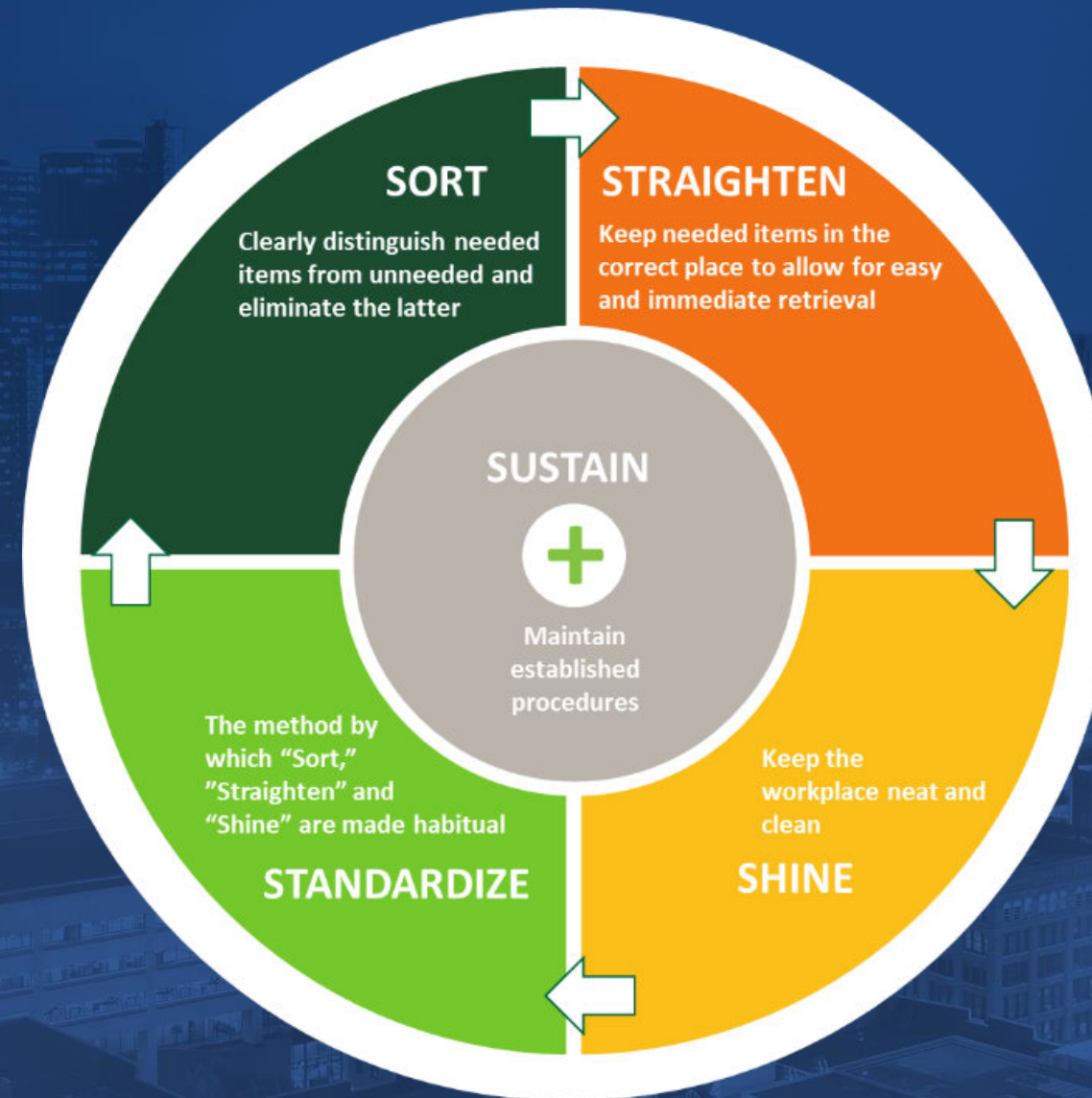
1. Develop **People** who apply *Lean thinking* to their daily work
2. Provide a **System** (or process) to support them

1. Design the best process you can
2. Document the process (Standard Work)
3. Continuously improve (Kaizen)



# What is a problem?

# 5S





Example of a standard process for 5S

Standard wording for subcontracts

“How to” on a project

5S ON YOUR PROJECT

GETTING STARTED

- Involve the entire project team. Get management buy-in and participation.
- Put in the extra effort up front to “sell” the team and for additional planning time.
- Include 5S in the subcontracts. Discuss 5S expectations at job start meetings.
- Get 5S training for the team. Learning by doing is the best teacher for 5S.
- If this is your first time with 5S, use a coach. It could be a consultant, internal lean expert, a superintendent or other project staff with experience implementing 5S on projects.

JUST-IN-TIME (JIT) DELIVERIES

- Bring tools, equipment and materials on site only when needed and ready for use
- Promptly remove tools, equipment and any remaining materials once work is completed
- Less stuff means less waste of space, movement, searching, potential for damage, safety hazards, etc.
- JIT deliveries apply well to commodity items from local or reliable suppliers
- Require GC approval for early delivery - Use buffers to insure material is available when needed, such as for items that are custom, with unpredictable lead times or are sourced from unknown or unreliable suppliers
- If space is tight, consider storing off-site until needed
- Expect resistance initially from trades (Foremen: this may be your office) who can bill for delivered material

EVERYTHING ON WHEELS

- Aim to store all materials in a mobile fashion. Pallets should have fork lifts or pallet jacks available nearby
- Mobile systems make it quick and easy to relocate laydown areas and keep needed items close to the work

SHINE

NOTHING HITS THE GROUND

- Prevent dirt and debris accumulation by dealing with it at the source where it's generated
- Minimize waste generation on site by prepackaging parts such as plumbing kits and prefabrication
- Have sufficient and suitable waste containers and cleanup tools. Make them mobile to easily move and dump
- Clean as you go. Work area is clean at end of shift or end of task, whichever comes first
- Do not allow work to start the next day if cleanup hasn't been done
- Continuous makes clean and organized the norm. Once per week cleaning makes dirty, disorganized the norm.

SUSTAIN

KEEP IT GOING

- Experience shows that it takes about a month for 5S to become a habit
- As trades mobilize on site, include 5S in onboarding and confirm they are adhering to, “just-in-time”, “everything on wheels” and “nothing hits the ground”.
- As trades see improved productivity and other positive benefits of good 5S practices, they will start to hold each other accountable to the standards

SETTING THE EXPECTATION

Set the tone for 5S use and collaboration to benefit everyone and make work flow efficiently.

EVERYTHING ON WHEELS

Keeps work areas clear and makes it simple to have materials and tools close to the work.

JUST-IN-TIME

Deliver materials or equipment when it is needed and not before. If needed, set buffers to insure the consistent flow of material.

NOTHING HITS THE GROUND

Continuous cleanup. No Friday composite crew. Coordinate language in the cleaning and trash removal section of subcontract.

5S IN THE SUBCONTRACT (This is a suggested language)

On this project, we will use 5S thinking and methods to influence safety, quality, productivity and to make work flow efficiently. All subcontractors will apply 5S methods in all their work including on site, in the supply chain and in their documentation.

Under the direction of Contractor, the entire construction team will collaborate to take a whole job approach to the organization, flow, delivery and removal of tools, equipment and materials.

Subcontractor tools, equipment and materials are to be kept organized. Laydown areas shall be assigned to each subcontractor and may change frequently throughout the course of the project. In some cases, due to jobsite constraints, assigned laydown may be limited or offsite. The team will work together to keep needed materials and tools as close to the work as possible. We will work to an “everything on wheels” policy. Subcontractors shall ensure that all materials are stored in a mobile fashion by using, without limitation, rolling cabinets, pipe racks with casters, or wheeled containers as much as reasonably possible such that laydown areas can be quickly repositioned. Subcontractors are to ensure that worker pathways and primary access to and from work areas are maintained.

Tools, equipment and materials shall only be brought on site “just-in-time” when they are needed and ready for use. Accordingly, subcontractor shall ensure that materials are ready for delivery to support the current project schedule to maintain workflow on site. Early delivery, such as to maintain a buffer of material, shall only be with the approval of Contractor. Once work is complete, tools, equipment and any remaining materials are to be promptly removed.

Excess or disorganized tools, equipment and materials will not be tolerated should it be deemed by Contractor that their presence or current condition has the potential to negatively impact safety, efficiency, the flow of work or the general morale or cooperation of other subcontractors. Subcontractor shall oblige any request by Contractor, acting reasonably, to organize or remove the tools, equipment or materials from the site. Correction shall be within 24 hours of notice or immediate if an unsafe condition exists.

The entire site shall remain clean at all times following a “nothing hits the ground” policy. All areas of the project, including work, laydown, lunch and parking areas shall remain clean and free of debris in a manner acceptable to Contractor. While excess material may naturally touch the ground during installation, to the extent practical, the subcontractor will “clean as you go”. The subcontractor shall not leave the work area without sweeping and removing all debris, either per shift or upon completion of the task, whichever occurs first. Subcontractor shall oblige any request by Contractor, acting reasonably, to remove any subcontractor generated debris. Correction shall be within 24 hours of notice or immediate if an unsafe or unhealthy condition exists. Failure to do so may result in the work performed in your behalf at subcontractor's expense.

Helpful tools to apply on project (This is for the team to use as an assessment tool, not a scorecard)

5S IN LEAN CONSTRUCTION

Lean Construction Institute

5S is a method to keep our workplace organized, clean, safe and efficient.

5S is about making work flow. It is a way of thinking to see and eliminate waste. What you need, where you need it, when you need it and nothing else. It is called 5S because each word starts with “S”.

5S is about SORT. It is common sense. It is also about the discipline to follow through.

USING 5S - IN THE FIELD

“Just-in-time” deliver material or equipment when it is needed and not before. If needed, set buffers to insure the consistent flow of material.

“Everything on Wheels” approach keeps work areas clear and makes it simple to keep materials and tools close to the work.

“Nothing hits the ground” is about continuous cleanup. No more Friday composite cleaning crew. Trades clean as they go.

USING 5S - IN THE SHOP

Visual. Everything has a clearly designated place.

Communication. Shop floor departments, the field and office work together to keep material flowing and reduce inventory.

Efficient and Safe Work Areas. Keep frequently used tools and materials close to the work. Clean continuously. Remove excess.

Personal and network folders are sorted and straightened. Shared folders are organized and managed with no random files. Finding things is intuitive.

Email. Keep the inbox empty. Don't use it as a to-do list. Set up subfolders. Keep messages short, 3 lines or less. If possible. Clear subject line.

Office supplies are standardized. Stock what staff really want and frequently use. Use a Kanban system to keep items in stock.

5S MAKES US BETTER

SAFETY - Less clutter is a safer place. The work area is clear and open. There are no distractions and distractions. People who respect themselves and others are more likely to keep their workplace clean and safe.

QUALITY - A clear and organized workplace can provide focus on work. They take greater pride in what they do.

PRODUCTIVITY - Tools and materials are easy to find. There are no interruptions and no time lost. The spread sheet shows working and how their doing work amounts.

SCHEDULE - Materials and equipment show up at the right time. There is no waiting for work. Work is predictable.

WHAT IS 5S ALL ABOUT?

5S is a method to keep our workplace organized, clean, safe and efficient.

5S is about making work flow. It is a way of thinking to see and eliminate waste. What you need, where you need it, when you need it and nothing else. It is called 5S because each word starts with “S”.

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DETERMINE WHAT IS NEEDED AND REMOVE EVERYTHING ELSE

Why? If you don't need it, it is waste. It is in the way just filling up space. It takes effort and costs money to store. It is clutter. Less clutter equals fewer hazards. It gets in the way of what you want. Sort, gang boxes, tool bags, desk drawers, computer file folders, laydown areas, trailers, offices, storage rooms and supply cabinets. Eliminate clutter.

“Just in Time” delivery. Don't deliver until an item is needed. Remove tools and excess material when the task is complete. Send them back to the yard. It is also about removing unnecessary forms, steps or reports. Keep it simple.

SET IN ORDER - A PLACE FOR EVERYTHING, AND KEEP IT THERE

Why? Don't waste time looking for things.

“Everything on wheels” - Work is constantly moving in the field. Make materials and tools easy to move so that they are close to the work and not in the way. Put the things you use most where they are easy to reach. Near the work. Clearly designated laydown areas. Label, color coding, signage lines on the ground. It is for electronic files and information also. Make it obvious where it belongs. Simple and neat. Don't overfill. Organize to make restocking obvious.

CLEAN AND KEEP IT CLEAN ...ALL THE TIME

Clean as you go is much more efficient than cleaning up afterwards.

“Nothing hits the ground” - Put trash straight in to rolling containers. Have sufficient dumpsters and trash cans, and never let them become full. Prevent dirt and debris in the first place. Have a method to put everything back where it belongs. Keep tools and machinery in good repair. Start with meeting areas, toilets, then the kitchen and lunch area.

CREATE STANDARD WAYS TO STAY ORGANIZED AND CLEAN

Why? So it can be repeated and improved without wasted effort. To standardize is to simplify. Find what works and do it. Everything becomes easier to maintain, train, support, buy and replace. Create a platform for innovation. It speeds improvement across the organization. Standardization reduces burden, confusion, and waste time looking for things. Standardize common tools and consumables, trailer layouts, forms, processes, filing systems and signage. Bring the best ideas together, standardize and share.

SELF-DISCIPLINE TO KEEP IT GOING

Why? So that the benefits of 5S continue. Everyone is responsible. Have a process in place to keep it going. 5S Assessments done consistently with follow-up. It is a daily habit. Set the example. Others will follow. Don't walk past a mess or a problem. Have the discipline to deal with it. Get to the root cause. Put 5S in subcontracts. Make the workplace visual, easy to see when something is out of place. 30 Second Test—Can you go to a gang box, cabinet, computer file folder and find what you are looking for in 30 seconds or less. If not, more work is needed.

with front line workers by off-standard conditions. Request corrective action, and verify project progresses of work planning meetings improve and drive actions. Involve premen meetings

that you tolerate. When setting nce is accepted and no one is nes the new standard.”

- KEYS TO SUCCESS
- Model the way
  - Implement early
  - Trade involvement
  - You get what you tolerate
  - Daily routines and accountability
  - Keep it simple and visual
  - Plan for appropriate cleaning supplies, waste bins and removal
  - Link to production, safety, quality

Designed to help, not create a lot of rules

Basis for training

5S TEAM ASSESSMENT

A tool for teams to self-assess their work area

Area	
Date	
Assessed by	

You should always be able to find something to improve. Go to where the work is. Observe. What can improve? Is there a problem? What is the root cause? Areas to assess can include outside the fence or building, site, roadways, parking, laydown, entrances/exits, waterways, corridors, hoists, kitchen, eating area, toilets and restroom, meeting areas, work areas, desks, gang boxes, storage areas.

5S Questions	Observation/Notes
<div><div>SORT</div><ul style="list-style-type: none"><li>Is there anything that doesn't need to be here?</li><li>Was it delivered too soon? Is there too much? Are we finished with it and this is just storage, storage or send it back?</li><li>Is anything delivered too soon? If there is anything not of date.</li><li>Are we using “just-in-time” delivery?</li></ul></div>	
<div><div>STRAIGHTEN</div><ul style="list-style-type: none"><li>Is anything out of place? Why?</li><li>Is there a place for it? Simple visuals to show where things belong?</li><li>Tools and materials are close to the work?</li><li>Safety equipment clearly labeled and easily accessible?</li><li>Is there clear directional signage storage?</li><li>Is “everything on wheels” or pallets with roller jacks?</li><li>Power cords off the ground, sufficient lighting?</li></ul></div>	
<div><div>SHINE</div><ul style="list-style-type: none"><li>Is the team using “nothing hits the ground”?</li><li>Is there dirt or debris on the floor, rolling containers?</li><li>What can be done to reduce trash generation?</li><li>Is there anything that is not clean or well maintained?</li><li>Is there clean cleaning supplies, including trash cans, brooms, dustpans? Are they properly marked? Close by?</li><li>Trash containers regularly emptied. Nothing overflowing.</li><li>Are floors organized and clean? Site ready for ramp/truck/crow?</li><li>Guard railings? Site fencing and signage clean and maintained, no trash outside fence. Right in main solution.</li><li>Roadways are parking well marked, clear and clear?</li><li>Meeting Areas. Clean and things put away after meetings.</li></ul></div>	
<div><div>STANDARDIZE</div><ul style="list-style-type: none"><li>Can we have a standard process? Make it simple?</li><li>Is there anything that can be standardized?</li><li>Instructions clear from this process works, how to clean and straighten, where things belong, how and when to remove?</li></ul></div>	
<div><div>SUSTAIN</div><ul style="list-style-type: none"><li>Is someone responsible? Is there a process in place to sustain?</li><li>Are standards enforced? Regular assessments and follow up?</li><li>Is it standard? Is there any clarity, discipline and easy to follow?</li><li>Is 5S the way things are done, people are proud of the results and work areas?</li></ul></div>	

Updated August 10, 2023. 5S is an improvement, not a punishment. Courtesy Milestone Lean Consulting LLC.



# 5S is about SIMPLE.

It is common sense and the discipline to follow through.

**SORT**

**STRAIGHTEN**

**SHINE**

**STANDARDIZE**

**SUSTAIN**



Make it easy to stay clean



What is good? What can improve?



Which one “shines”?





# 5S Assessment – Basis for Continuous Improvement



## 5S TEAM ASSESSMENT

A tool for teams to self-assess their work area.

Area	
Date	
Assessed by	

You should always be able to find something to improve. Go to where the work is. Observe. What can improve? Is there a problem? What is the root cause? Areas to assess can include outside the fence or building, site, roadways, parking, laydown, entrances/exits, exteriors, corridors, hoists, kitchen, eating area, toilets and restroom, meeting areas, work areas, desks, gang boxes, storage areas.

5S Questions	Observation/Note
<b>SORT</b> <ul style="list-style-type: none"><li>Is there anything that doesn't need to be here?</li><li>Was it delivered too soon? Is there too much? Are we finished with it and should remove, dispose, archive or send it back?</li><li>Posting instructions, rules? Remove anything not of value.</li><li>Are we using "last-in-time" inventory?</li></ul>	
<b>STRAIGHTEN</b> <ul style="list-style-type: none"><li>Is anything out of place? Why?</li><li>Is there a place for it? Simple words to show where belongs?</li><li>Tools and materials are close to the work?</li><li>Safety equipment clearly labeled and easily accessible?</li><li>Is there clutter (clutter is a local storage)?</li><li>Is "everything on wheels" or rollers with safety lock?</li><li>Power cords off the ground, sufficient lighting?</li></ul>	
<b>SHINE</b> <ul style="list-style-type: none"><li>Is the team using "nothing hits the ground"?</li><li>Is there debris being caught in the rolling containers?</li><li>What can be done to reduce trash generation?</li><li>Is there anything that is not clean or well-maintained?</li><li>Self-cleaning supplies, including trash cans, brooms, dusters? Are they properly marked? Close by?</li><li>Trash containers regularly moved. Nothing overflowing.</li><li>Are floors cleaned/dusted? Site mats for rain/mud/snow?</li><li>Good neighbors? No fencing and storage close and maintained, not out of sight. Hight or main solution.</li><li>Roadways are parking well marked, clear and clear?</li><li>Meeting Areas. Clean and things put away after meetings.</li></ul>	
<b>STANDARDIZE</b> <ul style="list-style-type: none"><li>Can we increase a standard process? Make it simpler?</li><li>Is there anything that can be standardized?</li><li>Instructions clear how the process works, how to clean and straighten, where things belong, how and when to receive?</li></ul>	
<b>SUSTAIN</b> <ul style="list-style-type: none"><li>Is someone responsible? Is there a process in place to sustain?</li><li>Are standards enforced? Regular assessments and follow up?</li><li>Is it visual? Instructions clearly displayed and easy to follow?</li><li>Is 5S the way things are done, people are proud of their jobs and work areas?</li></ul>	

Updated August 15, 2013. Some improvements are suggested.  
Courtesy of Milestone Lean Consulting LLC.

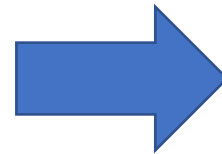
# Value Stream Management





# Example of a standard process for Design-Build Proposals

**Organized by workflow,  
not by department**



**Created as the result of  
value stream mapping and  
follow-up implementation**

**There are many sub-processes, but this  
document is the basis for planning and  
executing DB proposals**



Note: Intentionally blurred

**There is a value-stream owner responsible that the  
process is understood and followed by the proposal  
team, starting with the assigned project manager**

# Value Stream

The sequence of activities an organization undertakes to deliver on a customer request.

Examples:

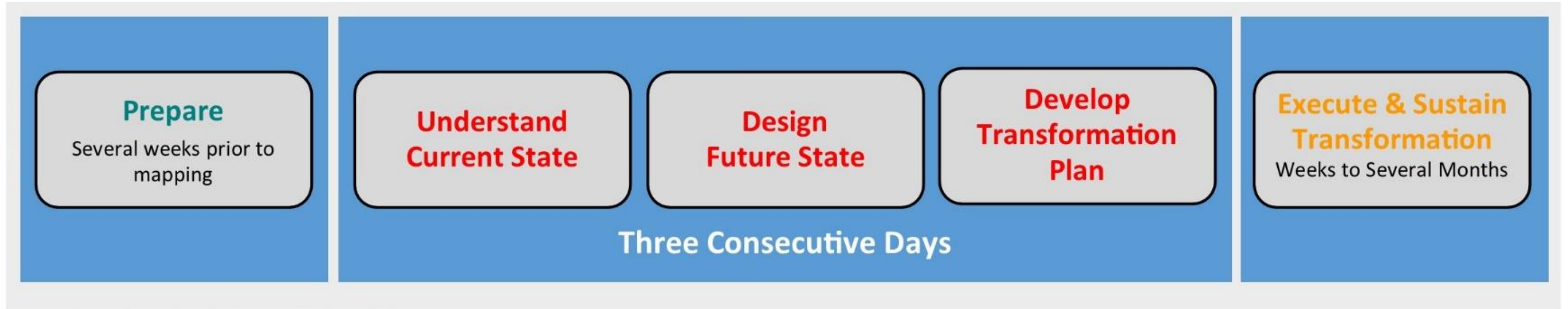
- Project from Notice to Proceed through Final
- Equipment from order to delivery
- Hiring from request to on board



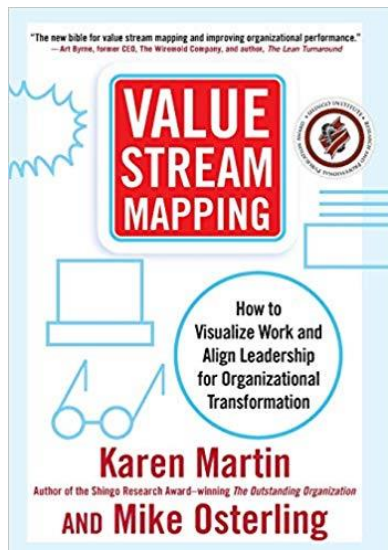
- Builds customer-centric processes
- Focus on flow and the flow unit
- Breaks down “Silos”. Encourages collaboration.
- Awareness and clarity as everyone sees how value flows and when it stops
- Establishes a standard for consistent performance
- Basis for continuous improvement

Is the Last Planner System a type of value stream management?

# Value Stream Improvement



based on Value Stream Mapping by Karen Martin and Mike Osterling

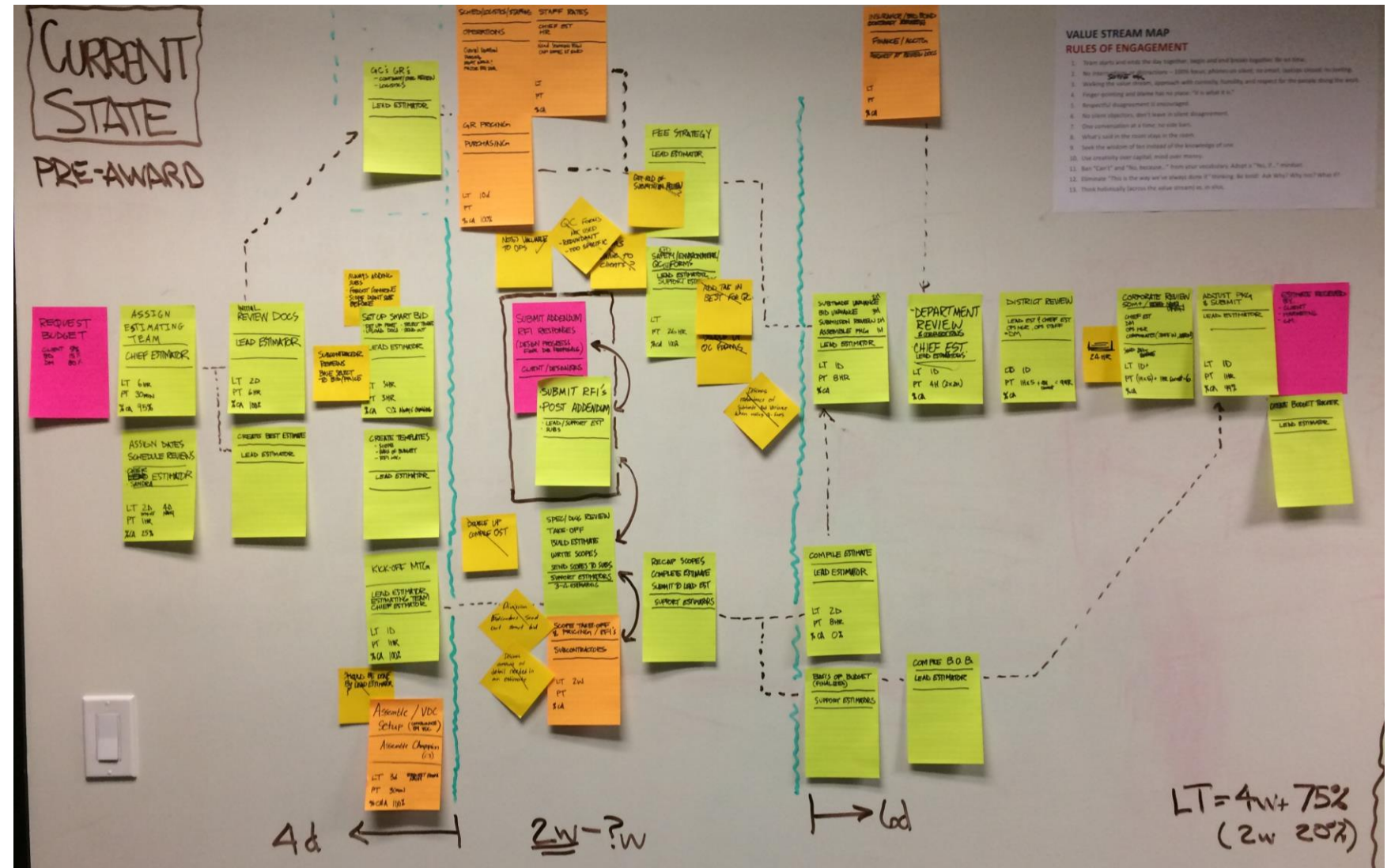
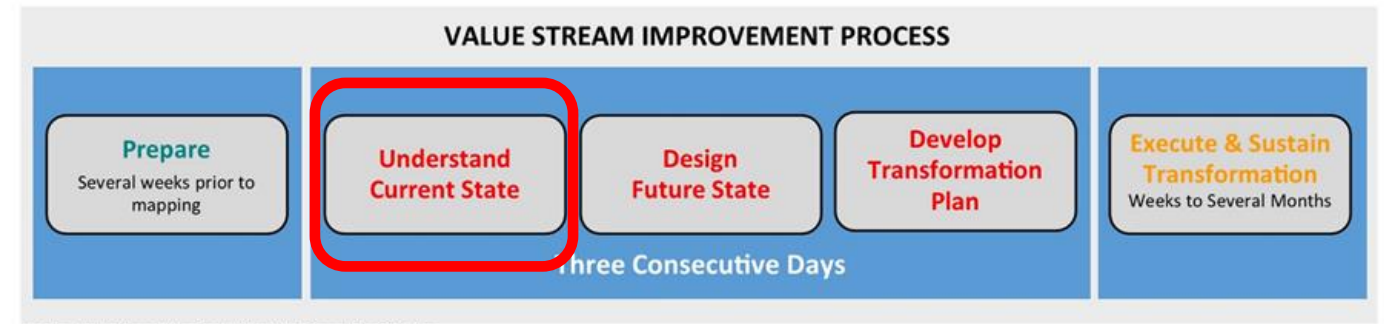




# VALUE STREAM MAP

## CURRENT STATE

- Depict the value stream process blocks - Chunk the work (Focus on handoffs)
- Do not solve problems or jump to solutions. Focus on understanding.
- Walk the value stream together. Talk to those who do the work. Just observe, ask questions, listen.
- Calculate LT, PT, and %C&A (other observations can be added to a list)



# Process blocks

(usually a hand-off point)

## LEAD TIME (LT)



Throughput time for the process. Time from the moment work is available in the queue until it is completed (Cycle time)

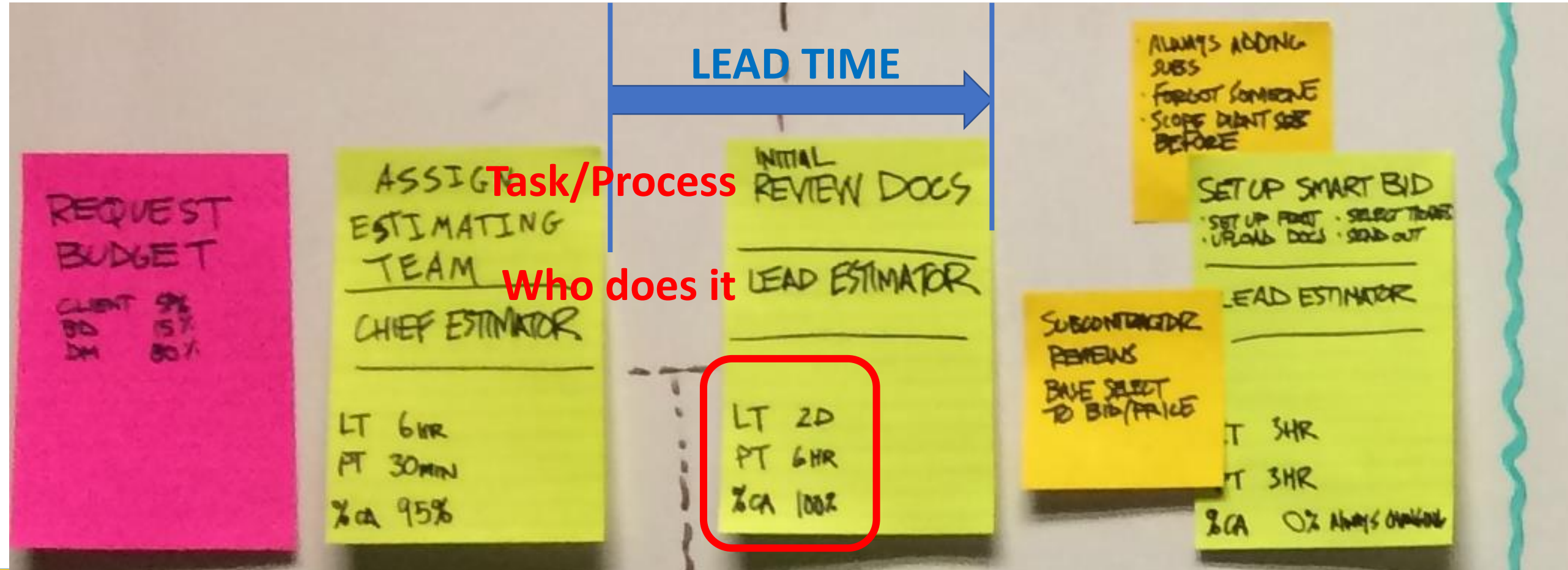
## PROCESS TIME (PT)



Total time to actually perform the process (transform input to output for one unit of work)  
Includes doing, read, think, meetings, etc.  
Not include waiting, delays, interruptions

## PERCENT COMPLETE AND ACCURATE

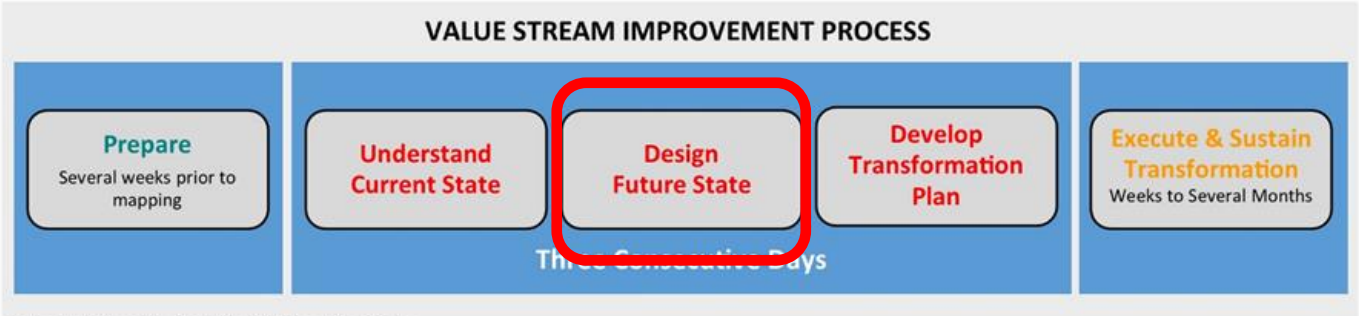
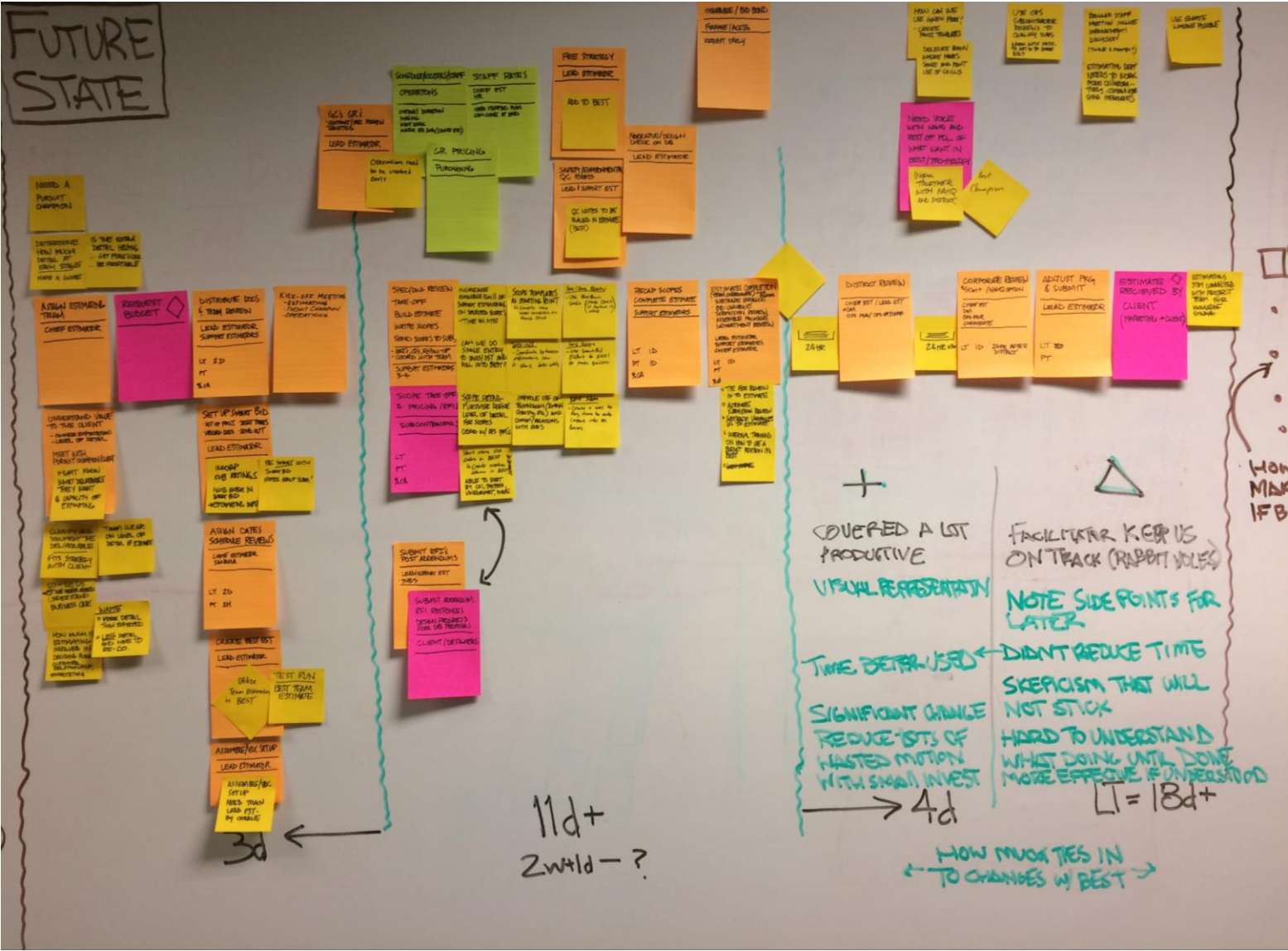
Quality. Ask downstream customer what percentage of the time they receive the work “usable as is”, no corrections required, no missing information





# VALUE STREAM MAP

## FUTURE STATE



based on Value Stream Mapping by Karen Martin and Mike Osterling

- Determine what work should be done. Remove waste
- Use pull for right work, right sequence, at right time
- Make work flow



# See Flow

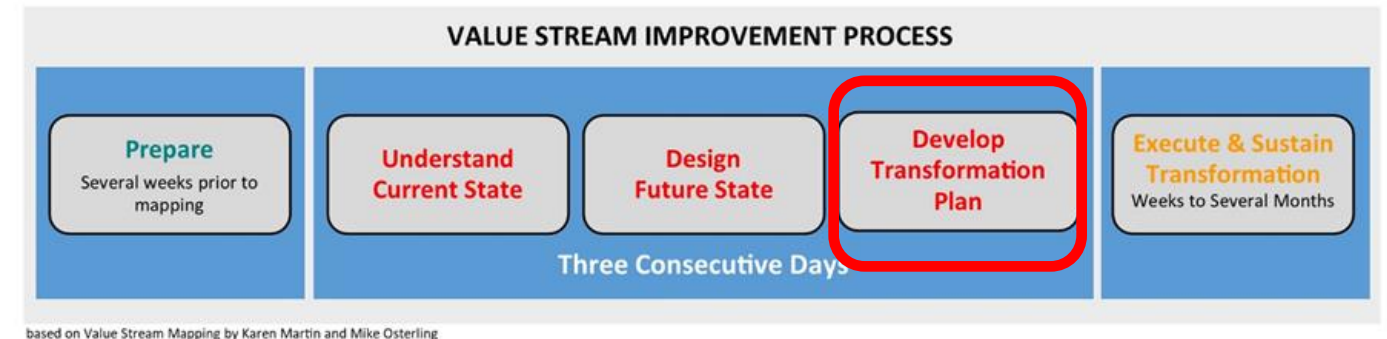




# VALUE STREAM MAP TRANSFORMATION PLAN

## Develop the transformation plan

- Just-do-its
- Kaizen Events
- Projects



Value Stream Transformation Plan																	
Value Stream		Outpatient Imaging					Scheduled Review Dates										
Executive Sponsor		Allen Ward					1-Nov-13										
Value Stream Champion		Paul Scanner					21-Nov-13										
Value Stream Mapping Facilitator		Dave Parks					13-Dec-13										
Date Created		10/18/2012					10-Jan-14										
FS VSM Block #	Measurable Target	Proposed Countermeasure	Exec. Method*	Owner	Planned Timeline for Execution												Status
					1	2	3	4	5	6	7	8	9	10	11	12	
2	Improve quality of referral to 85%	Implement standard work for referral process	KE	Sean Michaels												100%	
3,4	Reduce lead time between scheduling and preregistration step to 45 minutes	Cross-train and co-locate work teams	PROJ	Dianne Marie												75%	
4	Only one check in per patient	Collect copays in Imaging	KE	Ryan Austin												50%	
4	Reduce wait time in waiting area by 50%	Balance work / level demand	KE	Dianne Marie												50%	
6	Eliminate 6 hour lead time associated with transcription step	Implement voice recognition technology	PROJ	Dave Gerald												50%	
7	Eliminate redundant data entry	Auto populate between PACS and Meditech	PROJ	Dave Gerald												25%	
5	Visually managed inventory; no outages or expired items	5S CT supplies area; implement kanban	KE	Michael O'Shea												100%	
6	Reduce imaging LT to one hour	Assign value-stream specific radiologists	PROJ	Martha Allen												25%	
8	Reduce report delivery LT to 30 minutes	Increase % of physicians receiving electronic delivery	PROJ	Martha Allen												0%	
7	Reduce LT at image review to 1 day	Visual metrics and indicators	JDI	Dave Gerald												100%	
Agreement																	
Executive Sponsor			Value Stream Champion				Value Stream Mapping Facilitator										
Signature:			Signature:				Signature:										
Date:			Date:				Date:										

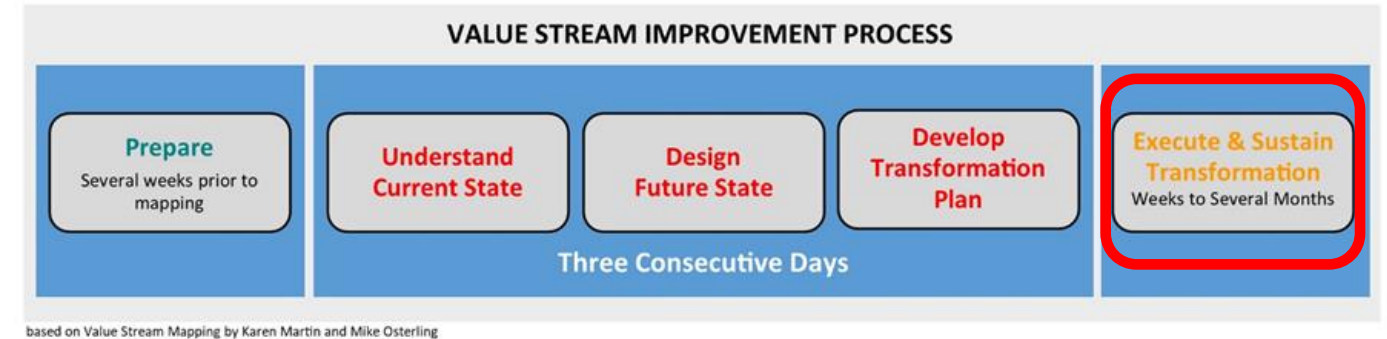
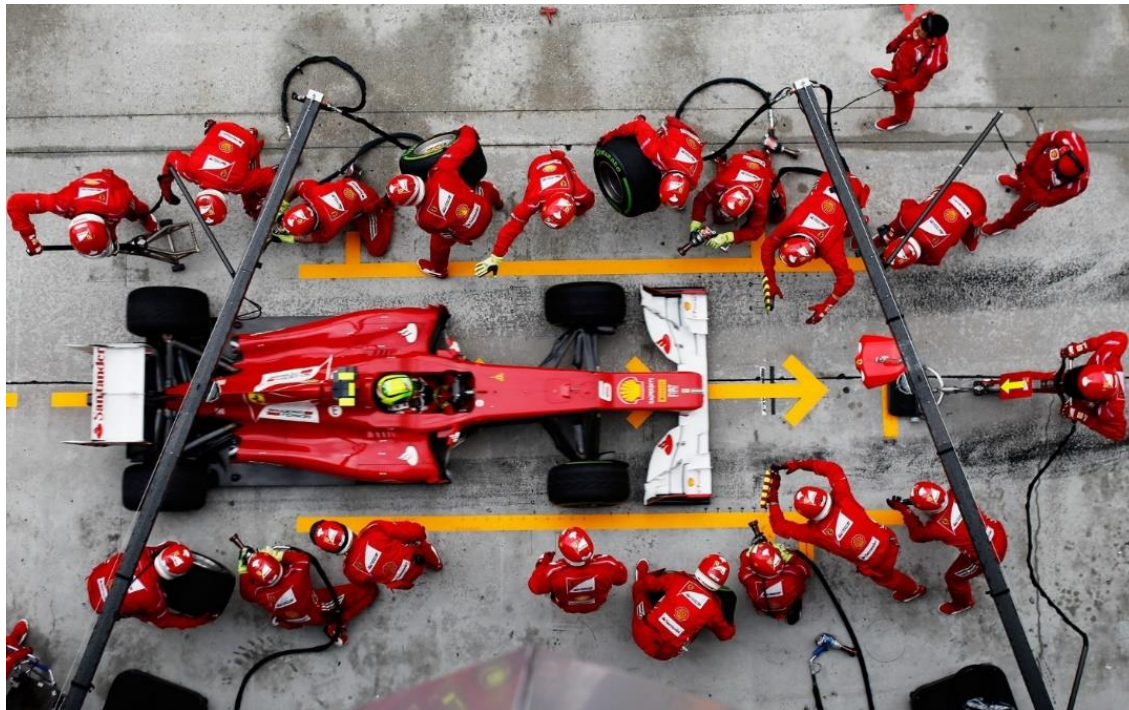
\* Execution Method = JDI (Just-do-it), KE (Kaizen Event), or Proj (Project)

v18

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# VALUE STREAM MAP

## EXECUTE PLAN



- Transformation will take place over weeks to several months
- Team meets regularly to review progress and course correct as needed
- Assign a value stream manager/champion. This is a permanent role
- Repeat the process regularly



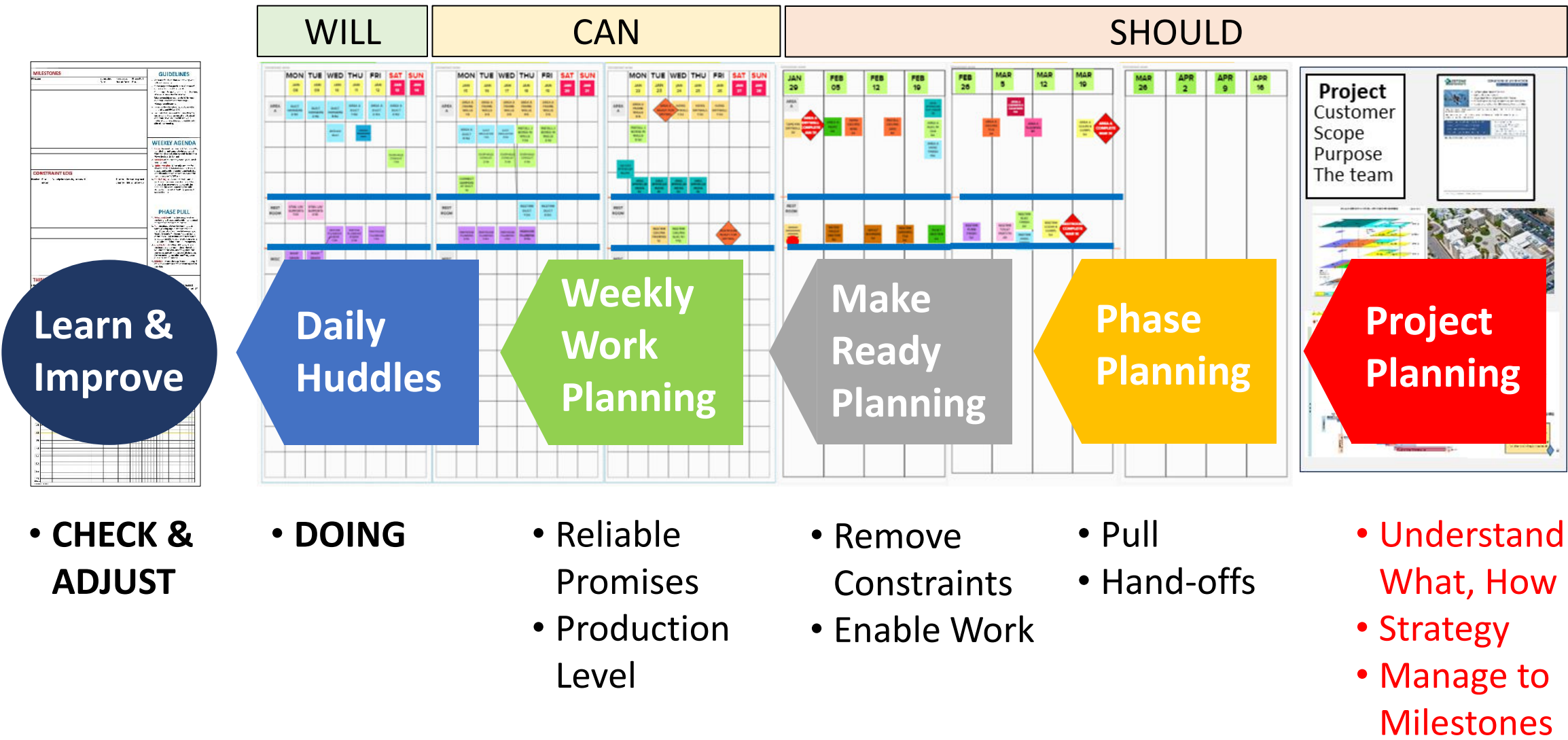


# Last Planner System

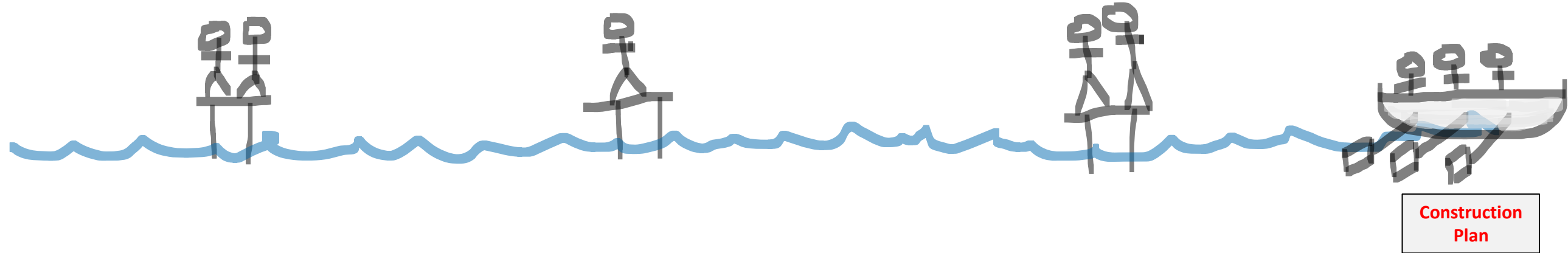


# LAST PLANNER SYSTEM<sup>®</sup>

Developed specifically for construction to create reliable workflow



**As a project progresses, different people get in and out of the boat.  
How can we keep the boat moving forward efficiently through the hand-offs?**



## **Manage by Value Stream**



- 1.Design the best process you can
- 2.Document (Standard Work)
- 3.Train the people doing the work
- 4.Continuously improve

- One person responsible for the process
- One person responsible for project life cycle
- Involve field staff early. Keep Precon staff involved.
- **Construction Plan** is unifying collaborative tool that grows and changes over time
- It is the strategy for executing the project



# Construction Planning

## Answers...

- **WHO** is the customer? What is important to them - Value? Conditions of satisfaction.
- **WHY** do this project? What are the goals of our organization for this project? Measure of success?
- **WHAT** is the project all about? What are the parameters?
- **HOW/WHEN** - Strategy for executing the project. Includes the schedule as a component.



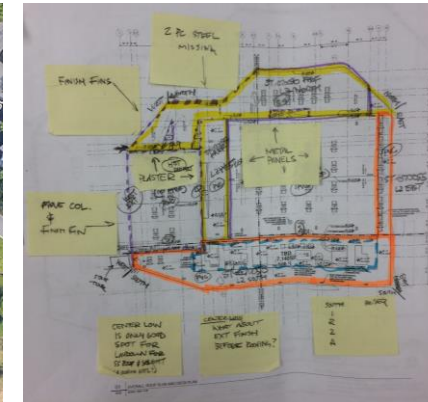
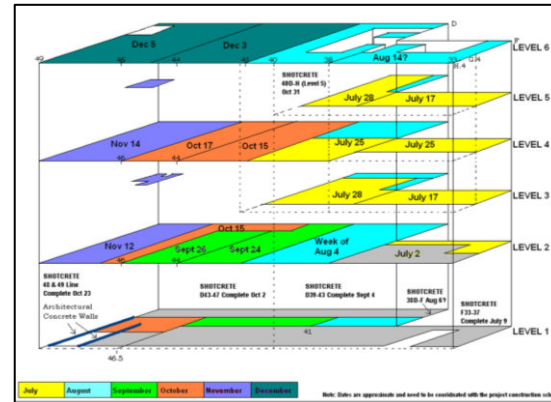
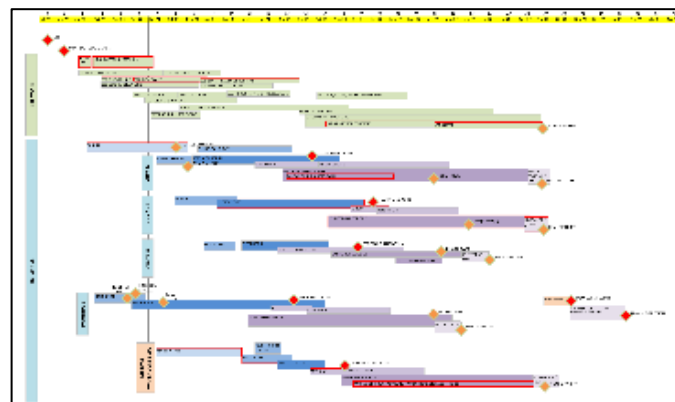
*Begins with the very first contact*

# Construction Planning

Living plan  
Develops gradually  
Will change and adjust  
Simple/Visual/Understandable  
Guides decisions



Why do we like drones?  
See > Understand > Manage



# Managing & Sustaining – Key Takeaways

- Leadership participation is required to sustain a culture of Lean thinkers.
- Set new targets for the lean program as you go.
- Never lose sight of your “North Star”. Your competitive edge is the value you deliver and that you can do it better, faster and cheaper.
- Be a learning organization. Everyone is involved in improving flow of value every day. Keep investing in your people because people create value.
- Have a process for not only capturing, but implementing, improvements as standard work.
- Keep learning, continue learning, don't stop learning
- Have fun. Celebrate success. Everyone wants fulfillment beyond a paycheck.

**Patiently keep building**

**Grow Lean Leadership**

**Manage by Key Behaviors**

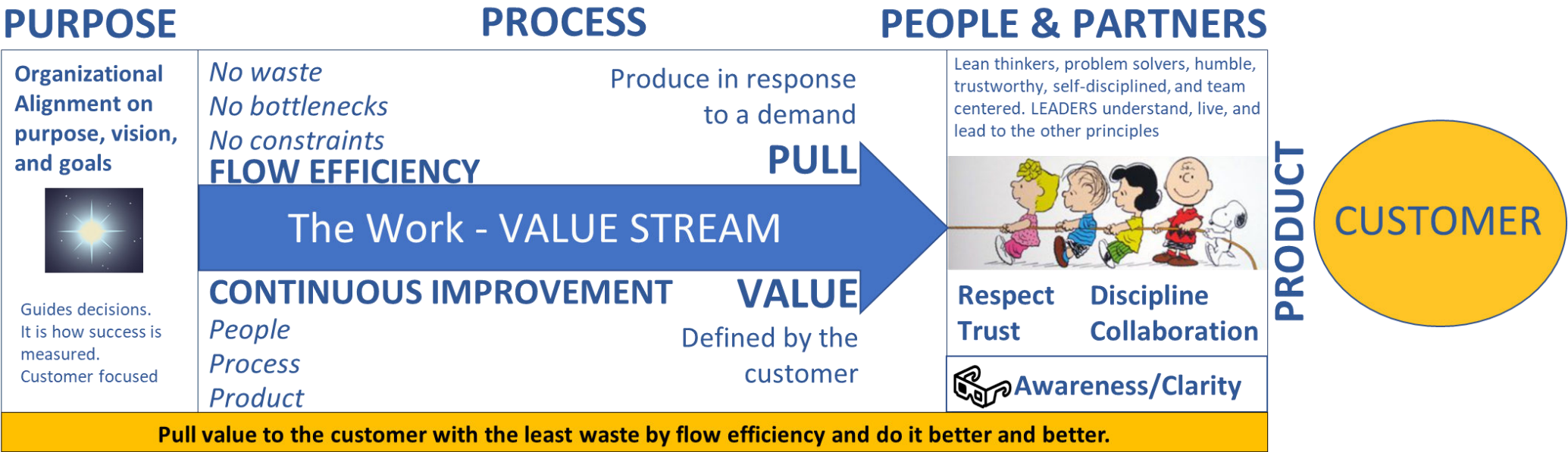
**Manage to value streams**



**Develop Lean Thinkers**

**Continuously improve**



# Lean Organization



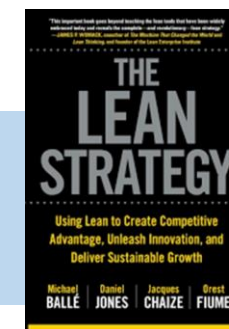
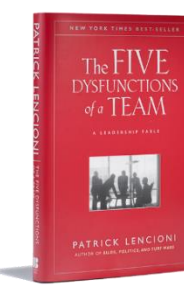
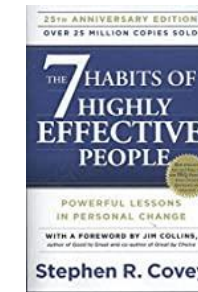
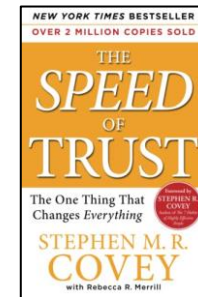
1. Develop <b>People</b> who apply Lean thinking to their daily work 2. Provide a <b>System</b> (or process) to support them		Lean Culture – Behavior based in lean principles and process	A Learning Organization - Structured to continuously improve	Lean Methods and Tools that put principles in action	Supporting Principles	
<div>Manage by Value Stream</div> <div></div> <div>1. Design the best process you can 2. Document (Standard Work) 3. Continuously improve (Kaizen)</div>	<div>Problem Solving – Identify and close the gap between where we are and want to be</div> <div><ul style="list-style-type: none"><li>Understand the current state</li><li>Design a future state</li><li>Create a transformation plan</li><li>Implement the plan</li></ul></div>			<div>Study Action Teams</div> <div>Visual Management</div> <div>Plus/Delta, Retrospectives</div> <div>Go-and-See</div> <div>Root Cause Analysis 5 Whys, Fishbone Diagrams</div> <div>A3 Thinking</div> <div>Direction/Strategy Mgmt.</div>	<div>Last Planner System®</div> <div>5S – Sort, Straighten, Shine, Standardize, Sustain</div> <div>Kanban</div> <div>Integrated Project Delivery Integrated Form of Agreement Big Room, Target Value Design, Set Based Design, Choose by Advantage</div> <div>Virtual Design, Visualization</div> <div>Kitting, Prefab, Modular</div>	<div>Quality at the source Solve at the lowest level Optimize the whole Continuous, one-piece flow See when flow stops Stop and fix the problem Just-in-Time Last Responsible Moment</div>

# How do we get there from here?

1. Develop **People** who apply *Lean thinking* to their daily work – THAT INCLUDES YOU



Consultant Training,  
Coaching and Facilitation



“Train the people doing the work to spot problems and then utilize their knowledge and skills to help improve the work”

– Steven Spear,  
*The High-Velocity Edge*

“Lean is a really, really different way of thinking”





In the spirit of continuous improvement, we would like to remind you to complete this session's survey! We look forward to receiving your feedback.



25<sup>TH</sup> LCI CONGRESS  
OCTOBER 24-27, 2023



**Plus:** What produced value during the session?



**Delta:** What could we change to improve the process or outcome?

Thank you for attending this presentation.  
Enjoy the rest of the 25<sup>th</sup> Annual LCI Congress!

Questions?



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