

A photograph of the Chicago skyline at sunset. The sky is a mix of orange, yellow, and blue, with scattered clouds. The city lights are on, and the water in the foreground is dark. The Willis Tower is the most prominent building on the right.

VSM: A Methodology for Sustainable System Improvement

Instructors: Jim Luckman , Tom Shuker

October 3-7, 2016



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Introductions

- Name
- What is your previous experience with Lean and mapping?

My Workshop Expectations



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The Agenda

- **Module 1** – Getting Started and Project Selection
 - Overview of Lean
 - Value-Stream Mapping Projects
 - Pre-Scoping – Selecting Value Streams to Achieve Purpose
 - Value Proposition/Scoping – Defining the expectations of a VSM Project
- **Module 2** – Current State
 - Mapping the Current State
 - Problem Solving Overview
 - The Problem Solving Process
- **Module 3**- Future State
 - Creating Flow
 - Doing the Work
 - Managing, Improving and Learning

The Agenda

- **Module 4** - Implementation Planning
 - Introduction to Goals and Action items
- **Module 5** – Setting the Conditions for Continuous Improvement
 - Creating a Visual Workplace
 - Creating a Management Cycle of Learning

Workshop Objectives

- 1. Learn the process for selecting projects that are tied to business objectives**
- 2. Reach consensus on how work is currently performed in a Value Stream.**
- 3. Reach consensus on how well the VS is performing now.**
- 4. Identify waste and underlying problems in Value Stream and prioritize the problems to be addressed.**
- 5. Reach consensus on what the Value Stream should look like after it is improved.**
- 6. Achieve measurable improvements in the Value Stream using an agreed upon Implementation Plan.**
- 7. Build in learning cycles to keep improving.**

Overview of Value-Stream Improvement

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Value-Stream Mapping: Why?



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- **VSM helps people SEE how the process works now.**
- **VSM helps people understand and reach agreement on how well the process is working now.**
- **VSM helps uncover waste and problems with flow in the VS.**
- **VSM helps people reach agreements on what changes need to be made to improve the process.**
- **VSM helps people reach agreements on how to ensure that those changes are made.**

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VSM: It's Not Just Another

Process Mapping Tool!

Value-Stream Mapping:

- **Uses a systems perspective**
- **Focuses on customer requirements**
- **Links work flow and information movement and quality**
- **Documents delivery and quality performance**
- **Highlights problems**
- **Allows process redesign to meet specific, agreed-upon objectives**
- **It is created by the value creators with their understanding and perspective**

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Most Organizations: Current State



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- **Functional Silos**
- **Results and Financials Focused**
- **Management Approach is Command and Control**
- **Most business and administrative processes evolved out of individual practices and procedures that have not been integrated**
- **People skeptical of improvement programs**
- **Improvements are event based not Continuous**

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Lean Is...

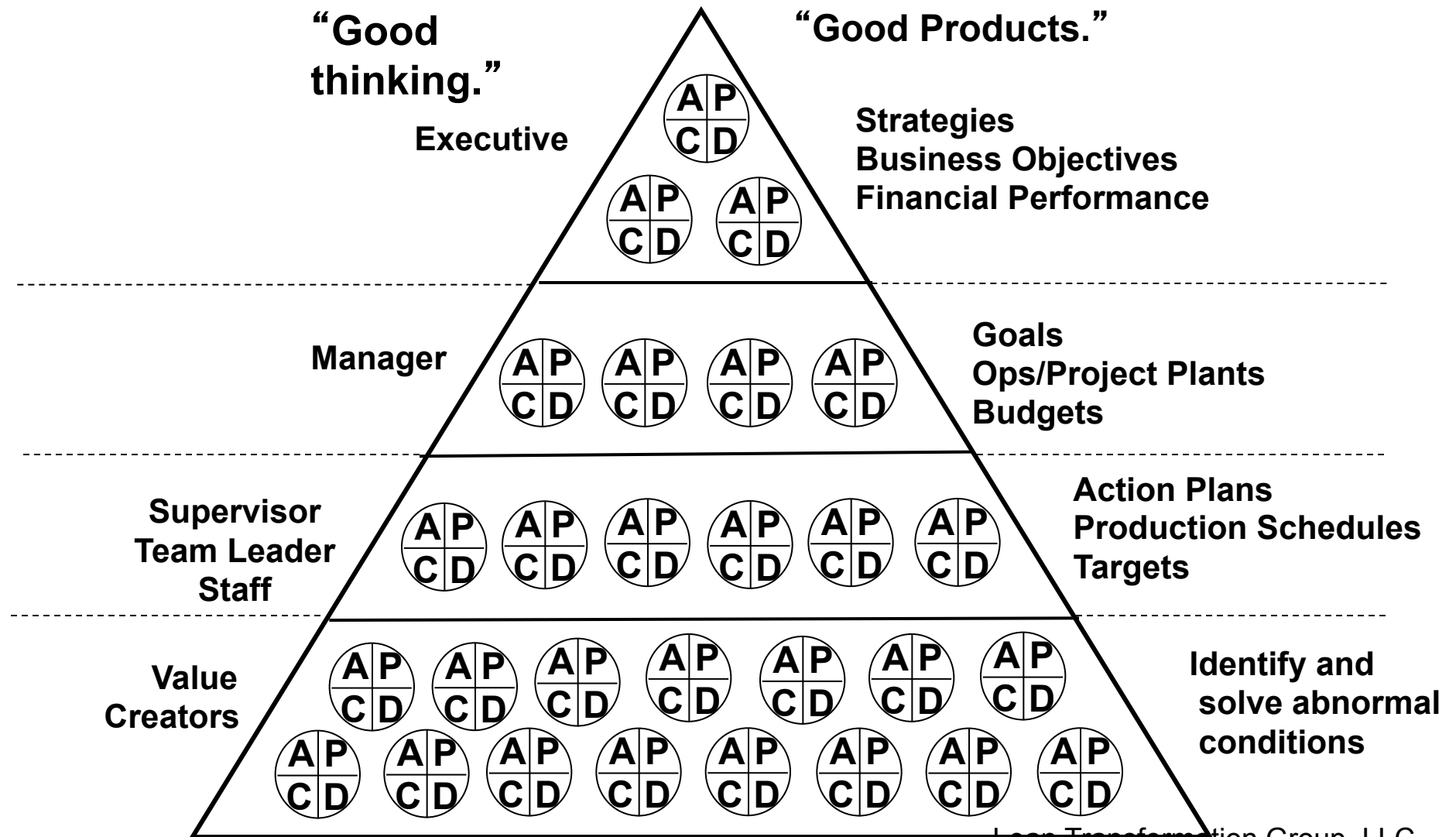
a business philosophy AND an integrated business system...

based on a set of concepts, principles and tools...

used to create and deliver the *most Value* from the *Customers' perspective* while consuming the *fewest resources*.....

by fully utilizing *the skills and knowledge* of those who do the work."

Problem Solving by Level 18TH LCI CONGRESS OCTOBER 3-7, 2016 • CHICAGO, IL



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How LEAN Implementation is



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The Challenge of Lean –

Integration of:

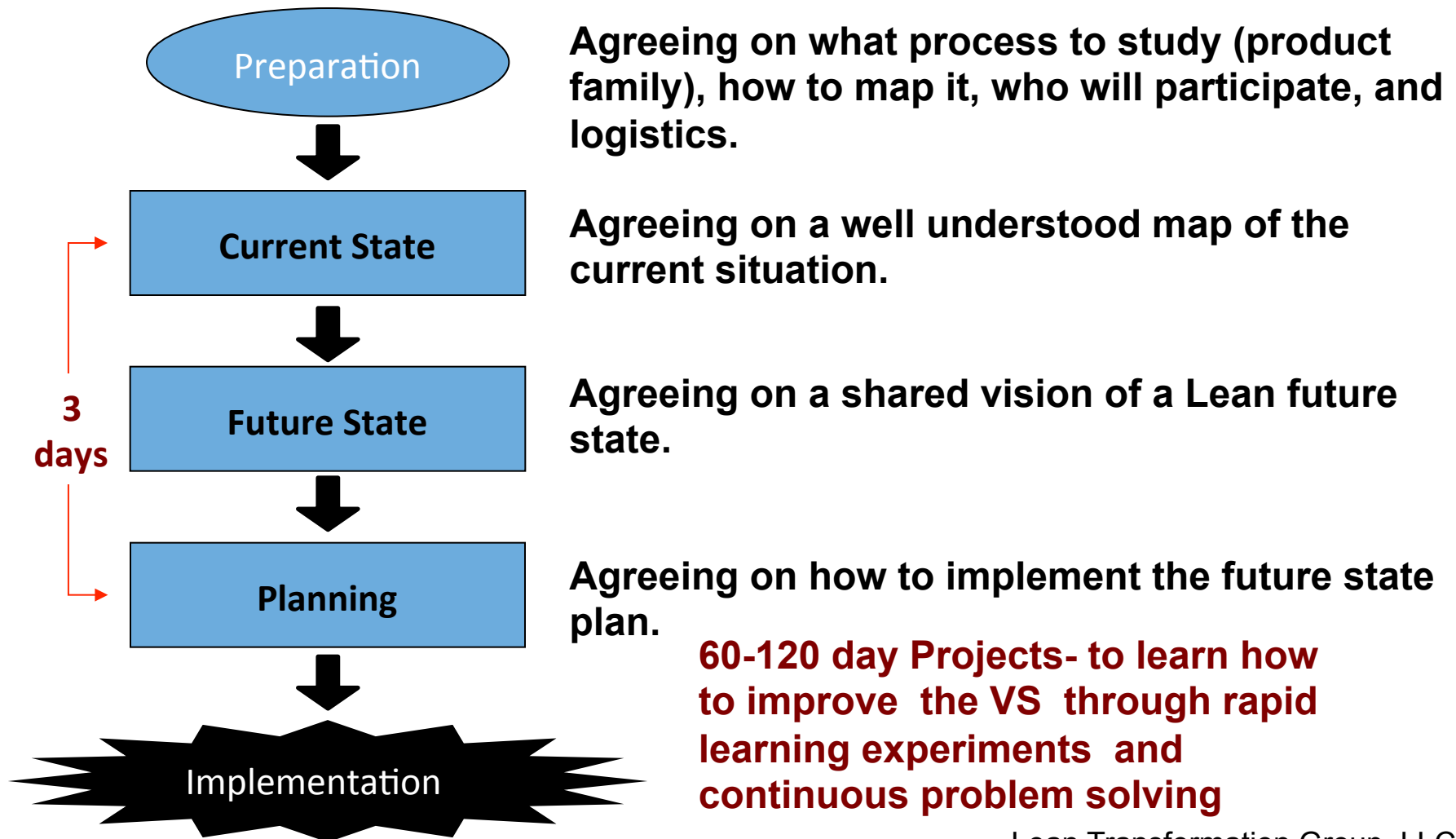
- Purpose** Consistently provide value to customers cost-effectively in order to prosper.
- Processes** Through the primary value-creating work flows for design, make, and ship, and the streams that support them.
- People** By engaging employees who do the value-creating work (including those in the support processes) in continuous problem solving to sustain and improve the processes.

Defining purpose & establishing processes while aligning people in an integrated business system is the central task of management in Lean. *Jim Womack, 2007*



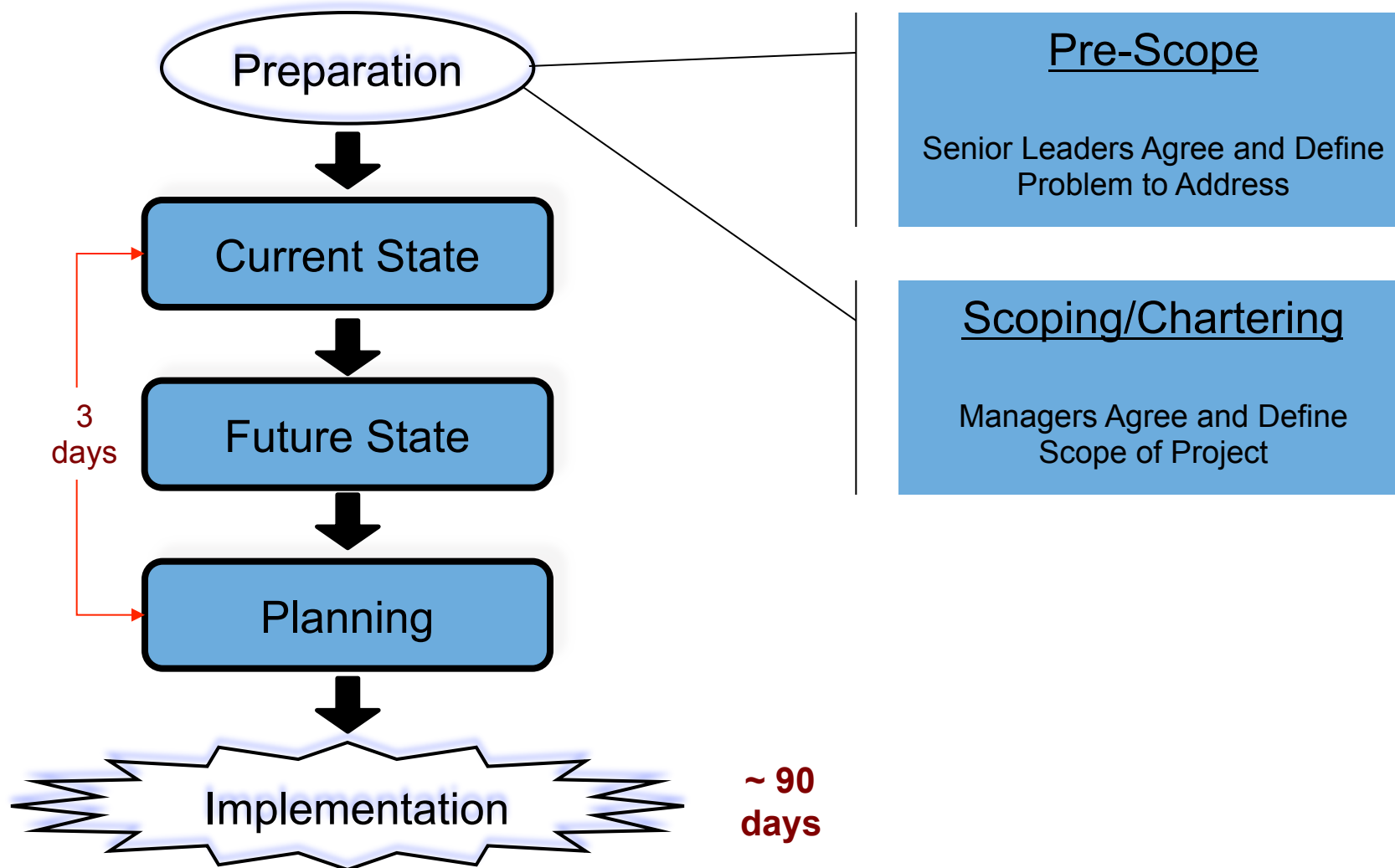
- **All work is coordinated and aligned with its purpose of creating customer value**
- **All functions are aware of their roles in the value stream**
- **The people closest to the work are engaged in designing and testing improvements**
- **Managers are focused on helping those who do the work solve their own problems.**
- **Improvement projects engage the entire organization, both horizontally and vertically**
- **Initiatives are selected as strategic business improvements rather than one time interventions.**

Applying the VSI Methodology



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VSI Methodology--Preparation

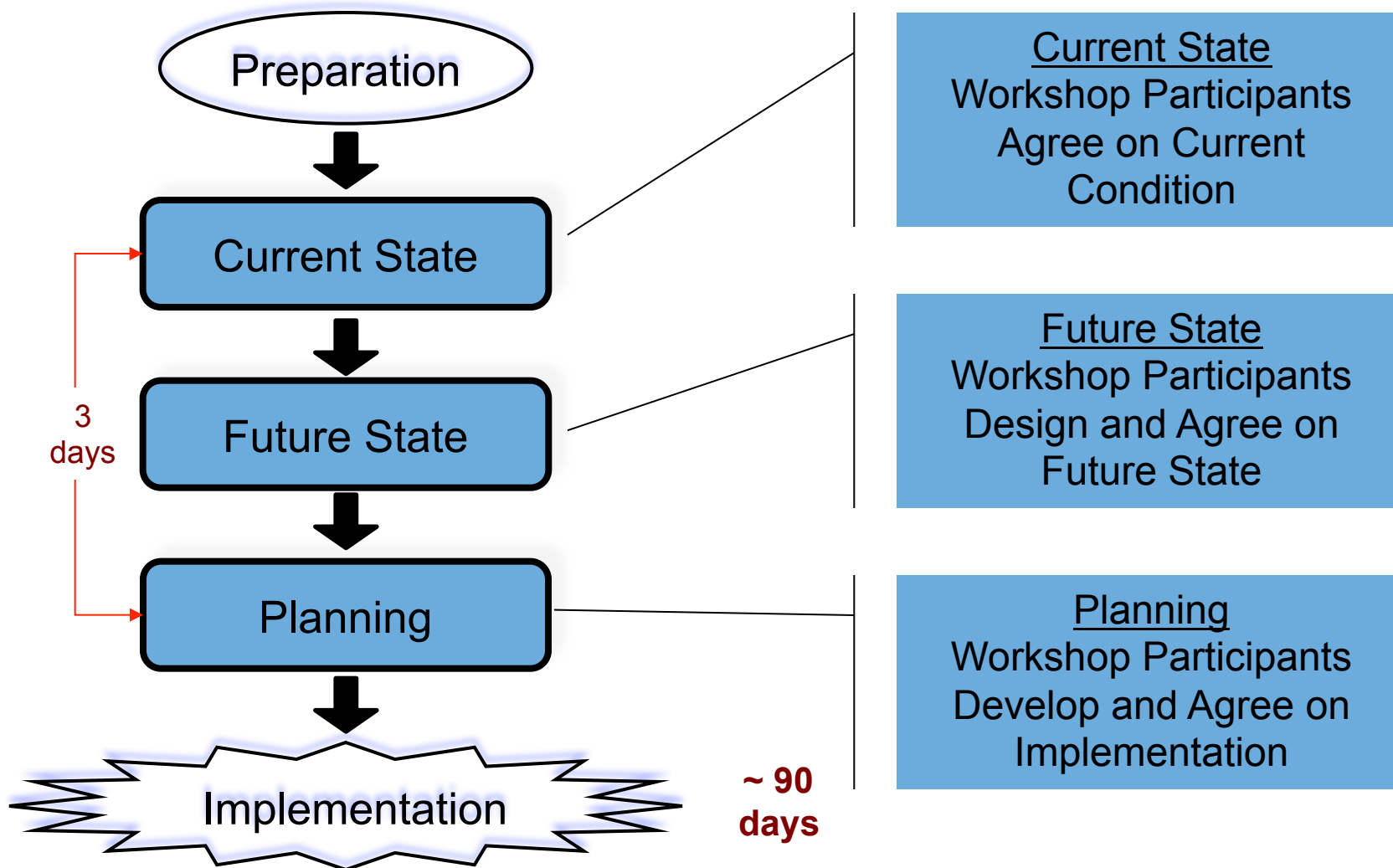


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VSI Methodology--3-Day Workshop



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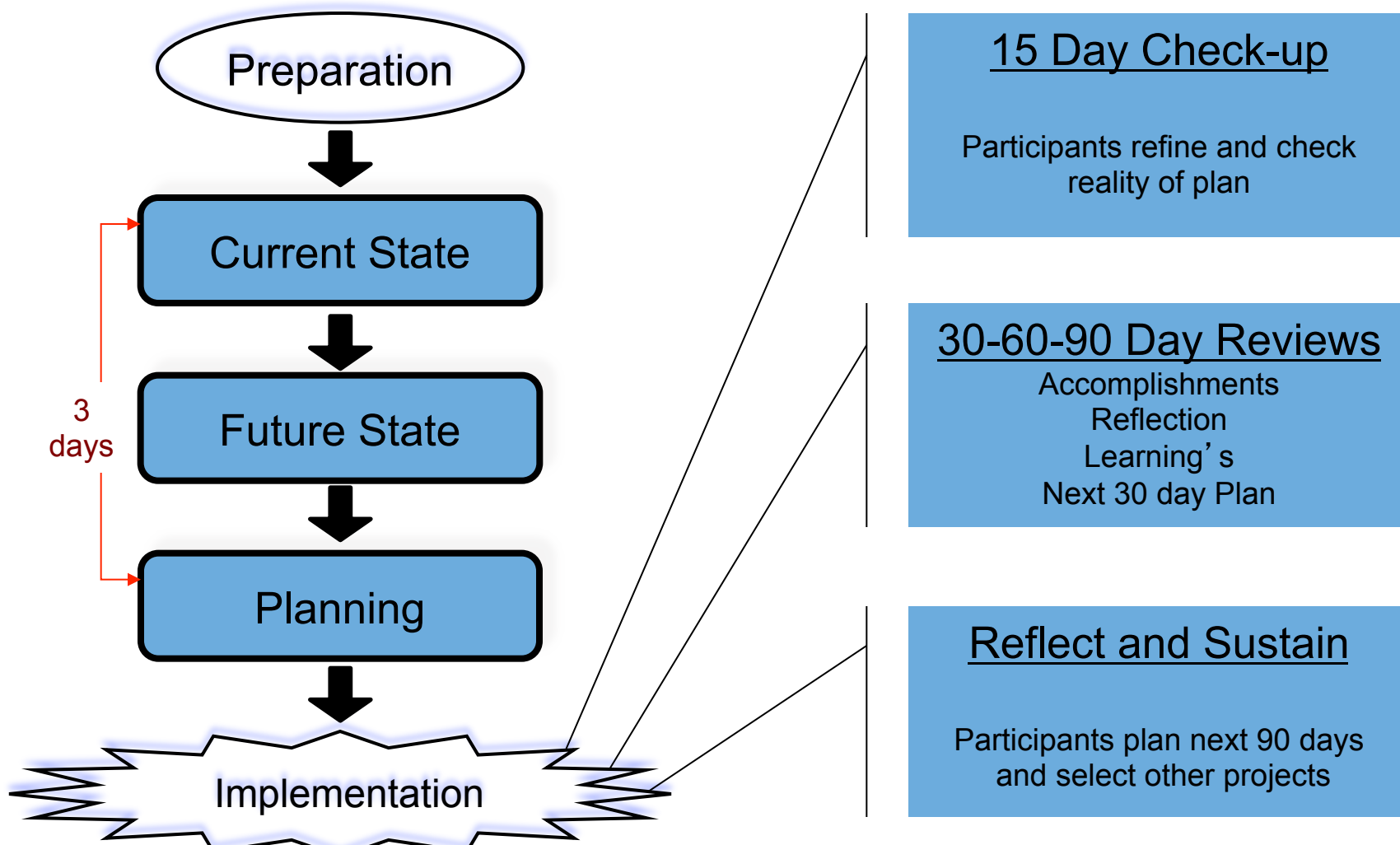


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VSI Methodology--Implementation



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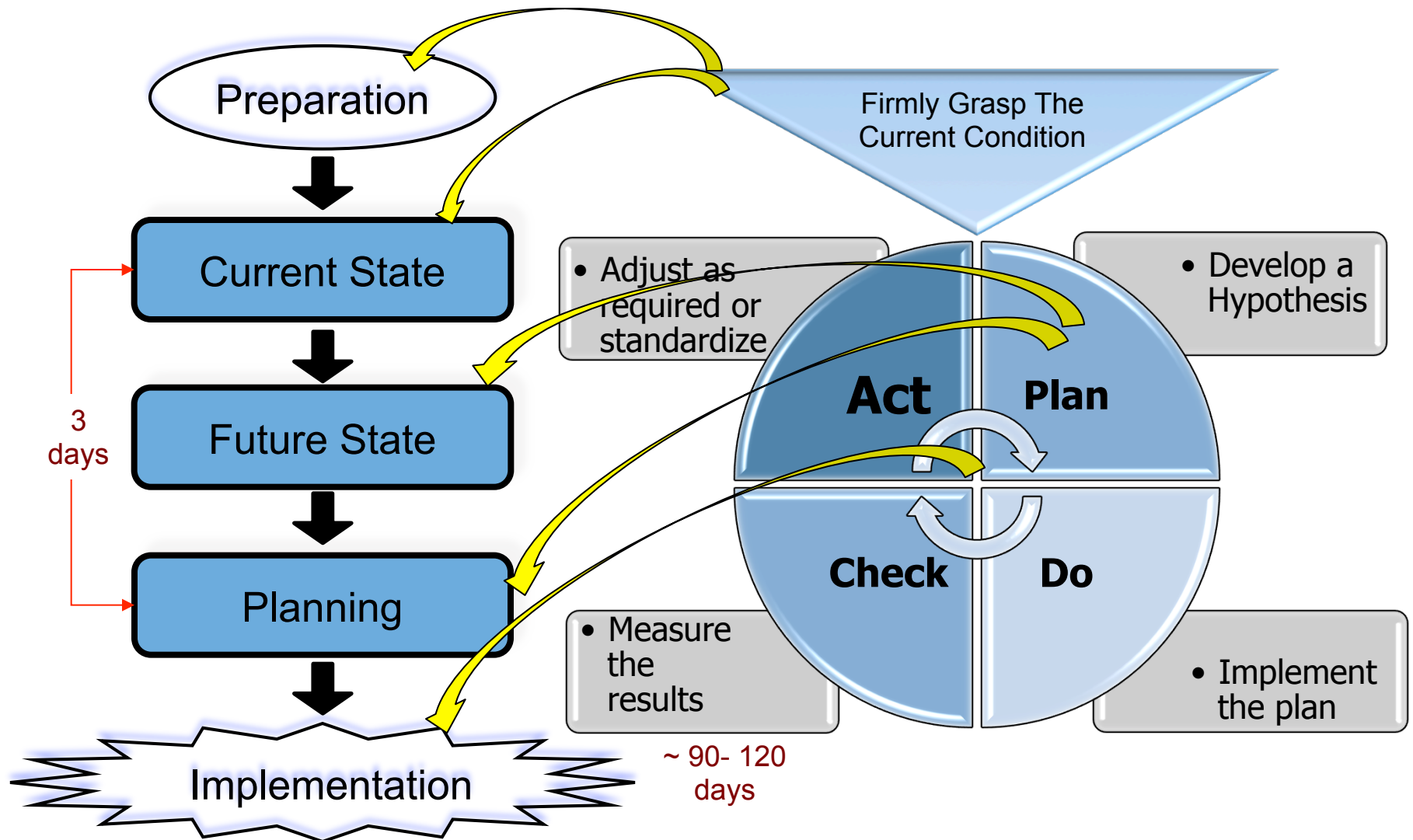


60-120 day Projects- to learn how to improve the VS through rapid learning experiments and continuous problem solving

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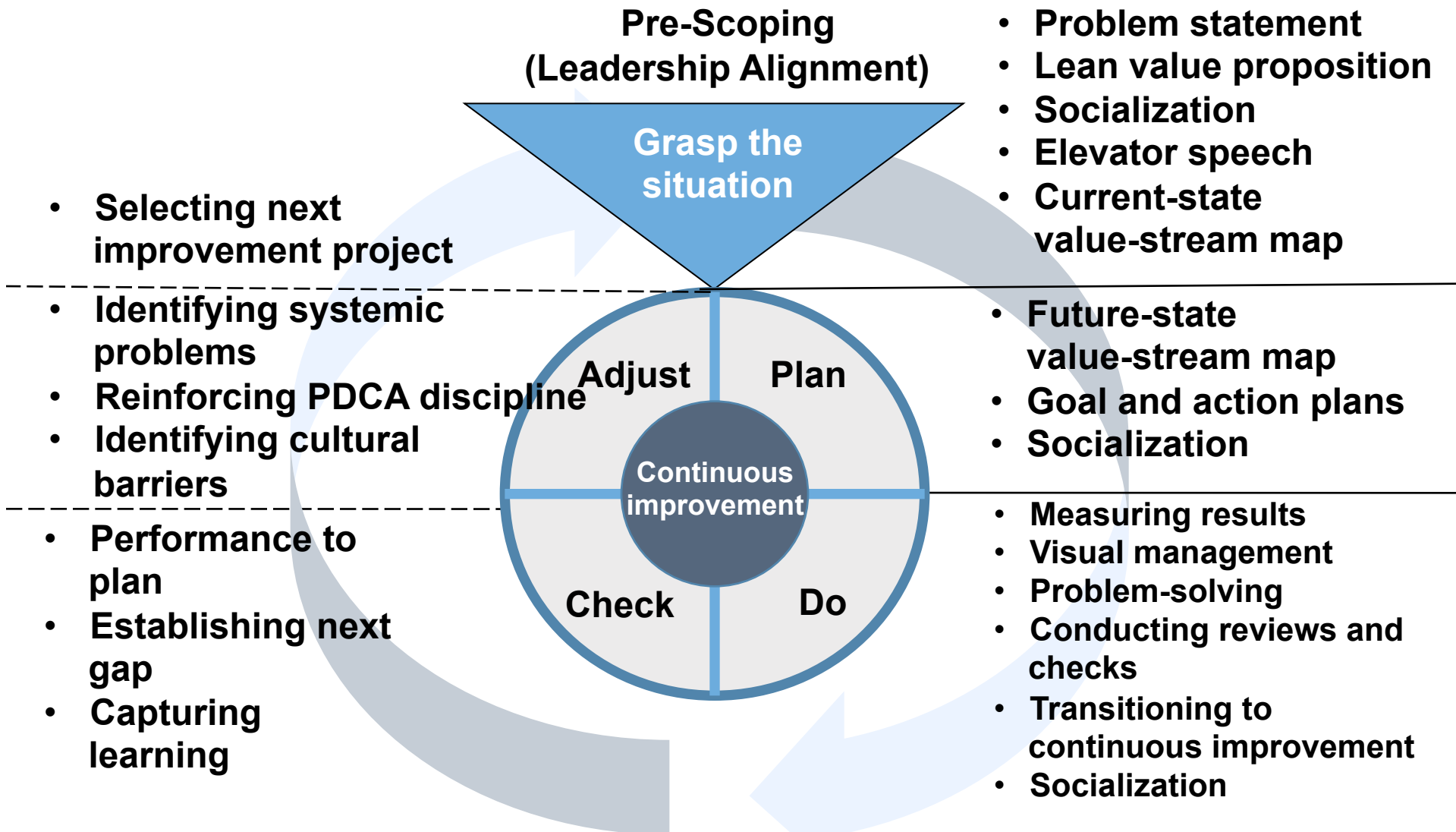
Value Stream Methodology & PDCA

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The Value Stream Improvement Cycle

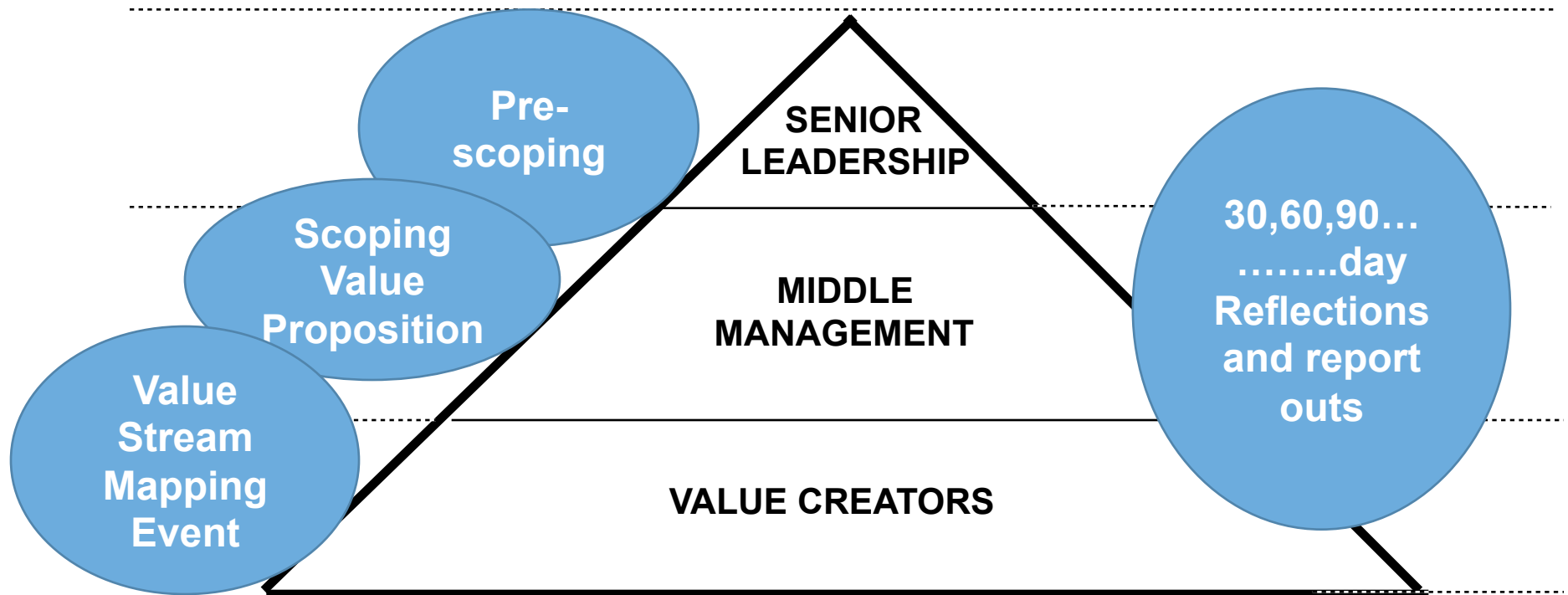


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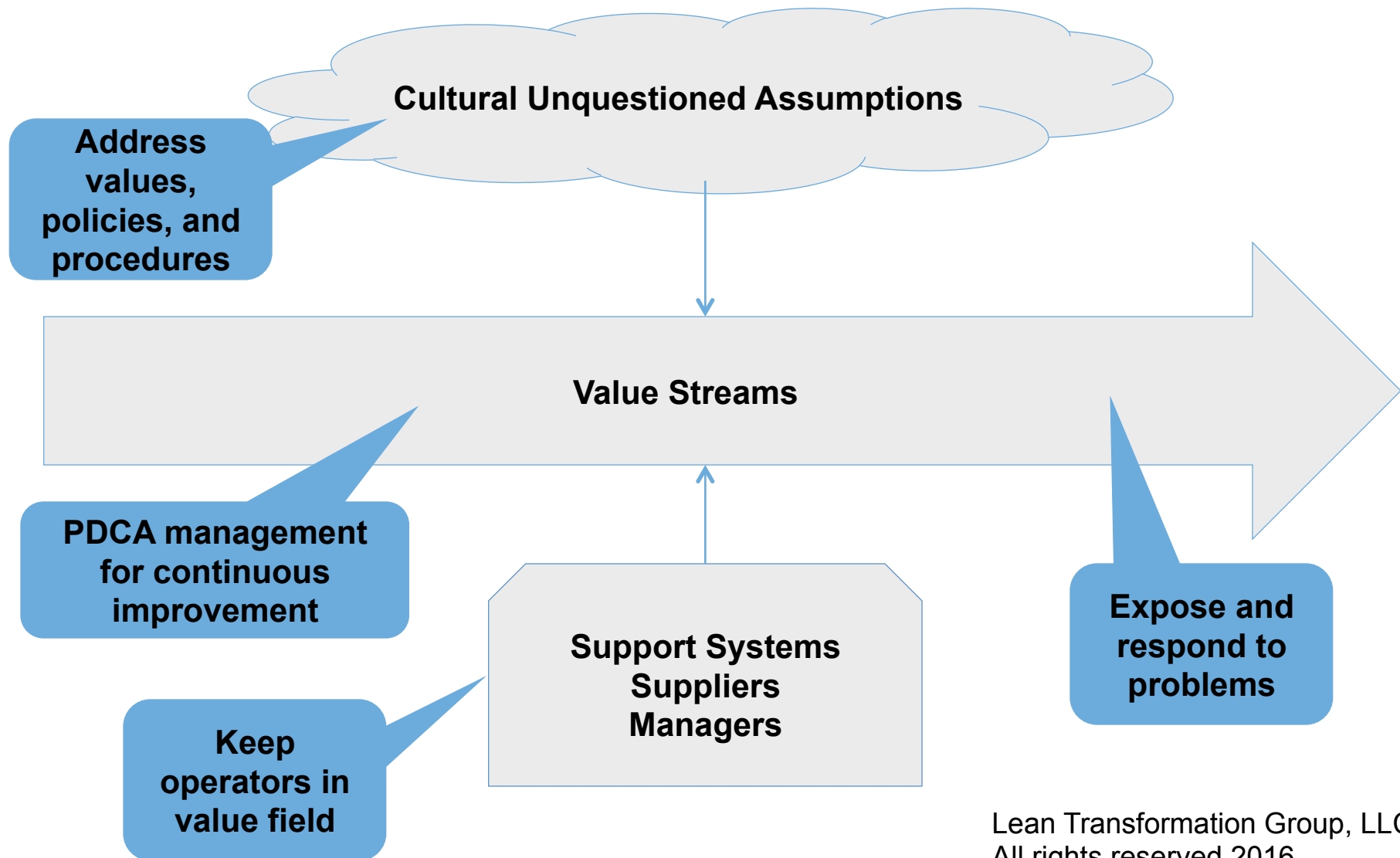
Value Stream Improvement Project

Engagement at all Levels

Activity by level



Problem Solving around Value Streams



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Alignment/Selection consists of two parts:

- Pre-Scoping
 - *Selecting Value Stream Projects tied to Business Strategies*
 - *Selecting Value Streams to Achieve Purpose*
- Scoping (Creating a Value Proposition)
 - *Defining the expectations of a VSI Project*



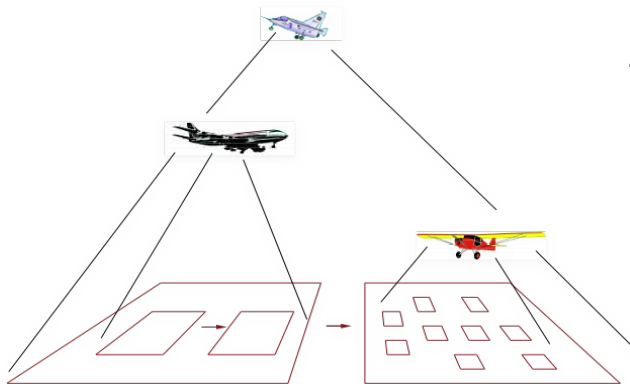
Pre-scoping



Purpose

Consistently provide value to customers cost-effectively in order to prosper

- Using “Zoom Control”
- At what level are you starting your lean journey?
 - *Enterprise?*
 - *Department?*
 - *Operating Unit?*



- Pick that level and tie Purpose into Business Need

Organizational Purpose

Purpose (*Business Need?*)

- Deliver/ Provide What (Output/Outcome)?
- To Whom (Customer) For Whom (Stakeholders)?
- Requirements/ Qualifiers
 - *How Much?*
 - *To What Extent?*
 - *When?*
 - *To What Standards?*



Processes (*Value Streams delivering Purpose/ Business need*)

- Primary Means of Delivery?
- Secondary – Support Primary Processes or the Organization itself



Performance to Purpose-Business Need

- Where (in which processes) are these shortfalls(problems) occurring or being created
- Problems (What are they?)
- Which outputs/outcomes are not up to the needs and requirements?
- Quality/Cost/Delivery that does not meet expectations

Pre-scope Requirements

Purpose: What is the value that the business/ organization creates and delivers?

Process (Value Streams): What are the primary and secondary processes by which the purpose is achieved?

Problems: What are the performance issues that are affecting the Business's ability to deliver value?

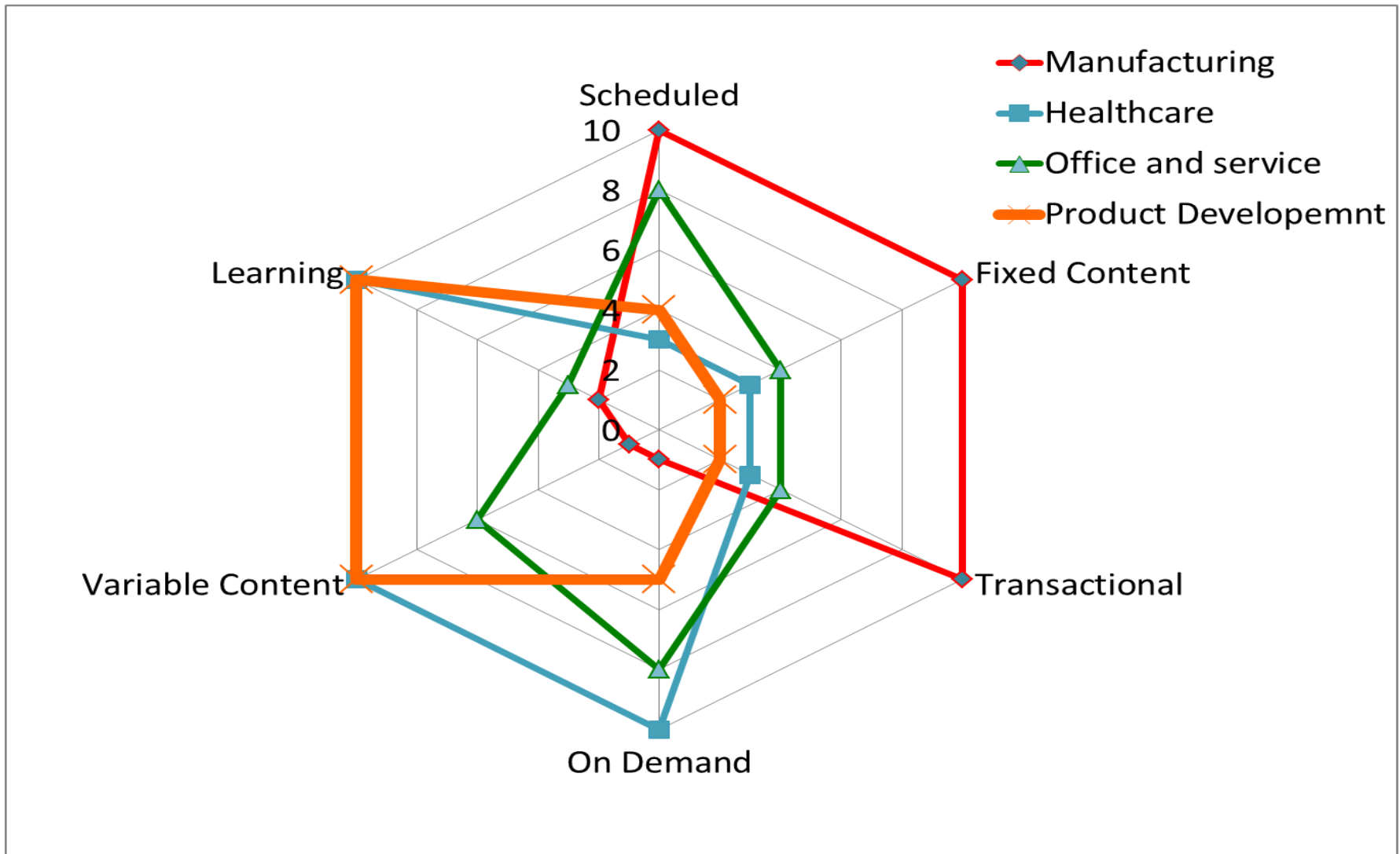
- What is happening now versus What Needs to be happening or What You Want to be happening? (Show the GAP visually with charts, graphs, maps in terms that can be measured)
- What is the strategic, operational, historical or organizational context of the situation?

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Key Characteristics of

Value Streams What should I work on?

- **Scheduled vs. On Demand** – Does the VS run to a Schedule where a planned event triggers the start or is it triggered by an outside event?
- **Fixed vs. Variable content** – Is the Value added content fixed (defined) or variable?
- **Transactional vs. Learning** – Is the purpose of the VS to collect and/or create Knowledge (Learning)? Or is the repeated stable process?



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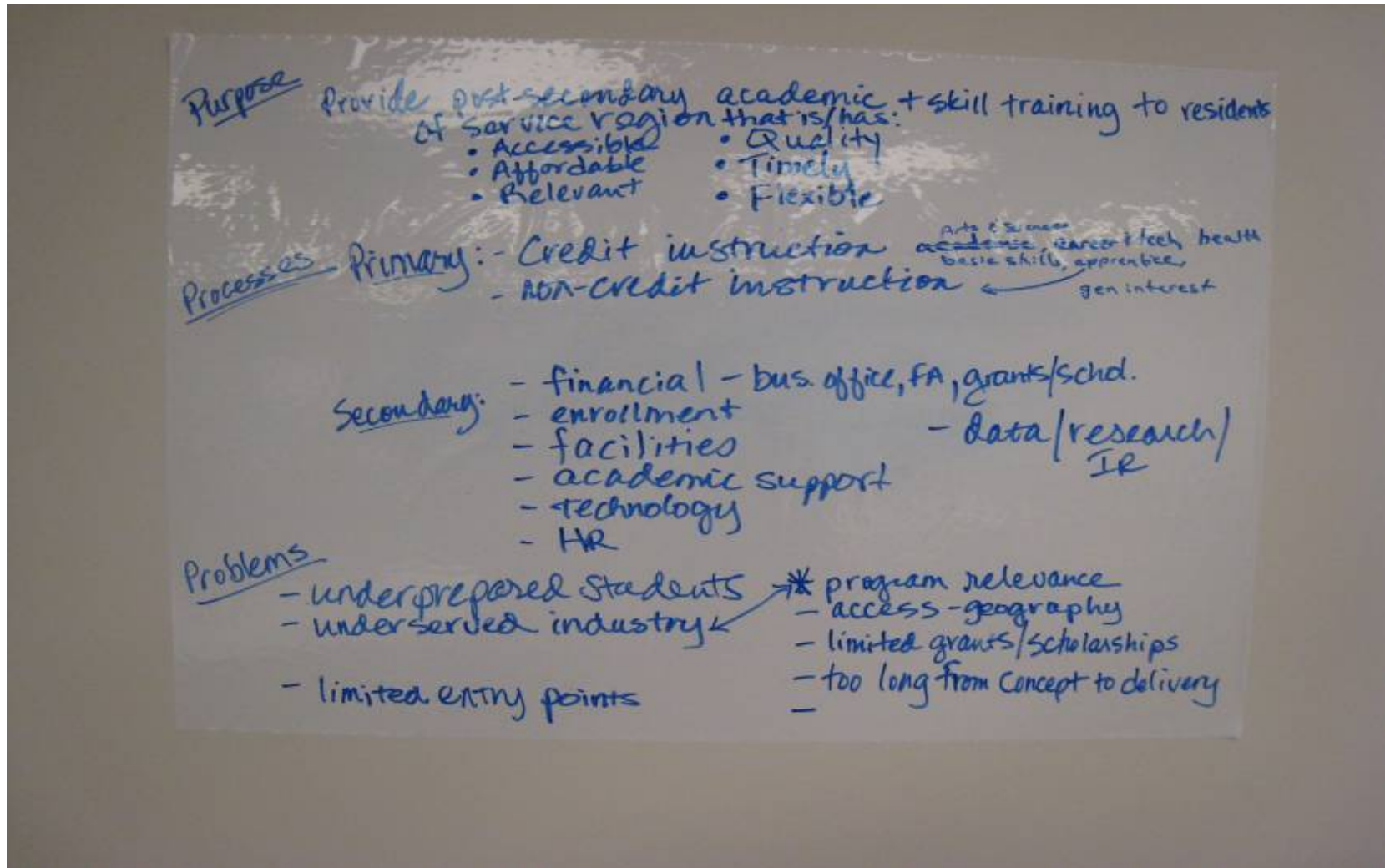
Pre-Scoping Requirements Document

Purpose - The Value the business creates

Process - Value Streams supporting the Business' s creation of Value

Problems - Performance issues affecting the Business's ability to deliver value in measurable terms as a defined gap.

Example of Pre-Scoping - Community Colleges



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Pre-scoping Exercise

- Select your Case Study and join a Team
- Read your Selected Case Study
- Develop Pre-Scope Requirements Document (30 min)
- Discussion and Report Out

Value Proposition- Scoping

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CRITERIA FOR SELECTING – FULL BLOWN VSI ONLY

1. Does the request concern a single process or multiple processes? (If single, consider point kaizen)
2. If single process, does it involve multiple functions/ disciplines? If yes, consider CS map only with PS or single point kaizen.
3. If multiple processes, does the value stream/work flow:
 - Consume too many resources?
 - Have significant quality, cost or delivery problems?
 - Link to the organization’s mission/vision/strategic or annual plan and priorities?
 - Have clear owners and stakeholders?
 - Have a defined scope and associated performance metrics and can be mapped?
 - Include enough problems (or have problems of sufficient organizational impact) that it is worth the time and effort to apply a full blown VSI approach?

Scoping Elements

- Lean Value Proposition
- High-level Value-Stream Map
- In/Out of Scope
- Participants
- Logistics

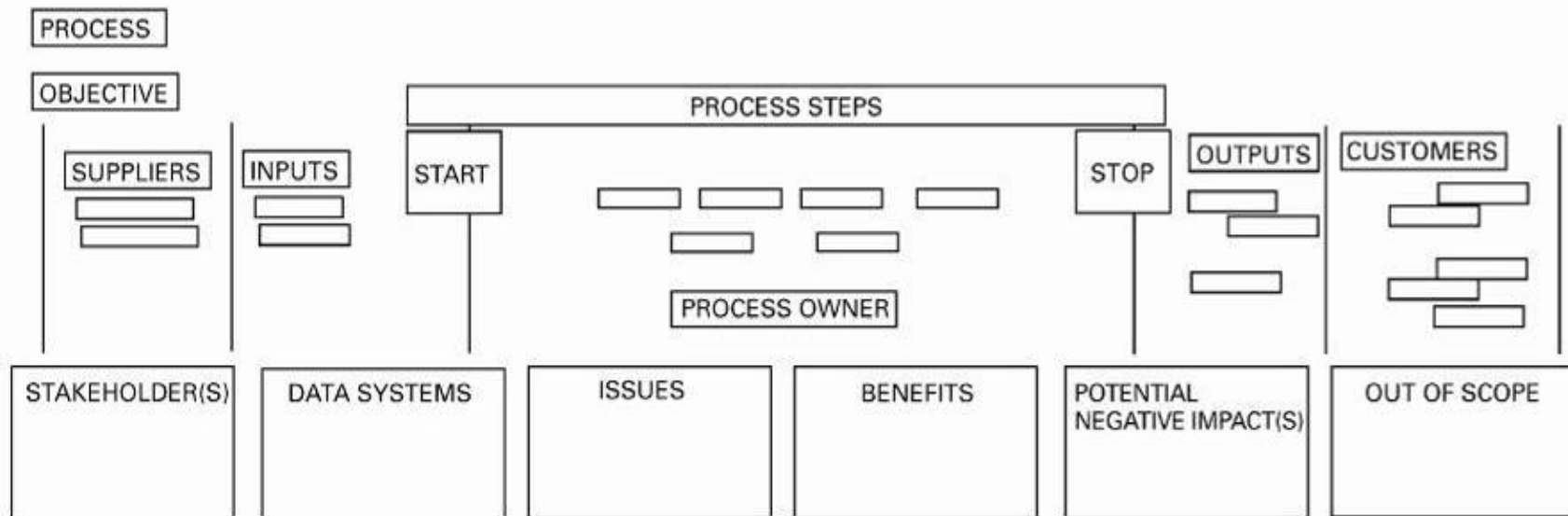
*Scoping is essential for successful
Value-Stream Improvement and Lean
Implementation*

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The Value Proposition Format

Consider a project in the context of *suppliers* who provide *inputs* in the form of data, knowledge or resources, and the *outputs* for whom there are *customers* who use the output of the process.

Consider all elements of the system and set clear boundaries for the overall scope of the process, (decide where work starts and stops for this project).



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Value Proposition Template

Project Name:		Project Name:		Date:	
Value-Stream Owner:		Project Owner:			
Objectives:		Goals:		Objectives:	
	Start:	End:			
Suppliers	Value Stream: High-level map or list of processes inside VS			Customers	
Inputs				Outputs	
Current Metrics				IT systems	
In Scope				Out of Scope	
Issues and Problems:			Benefits vs. Impacts		
Workshop Logistics	Workshop Participants	Leadership Panel	Next Steps		
Date:					
Time:					
Location:					

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From *Perfecting Patient Journeys*

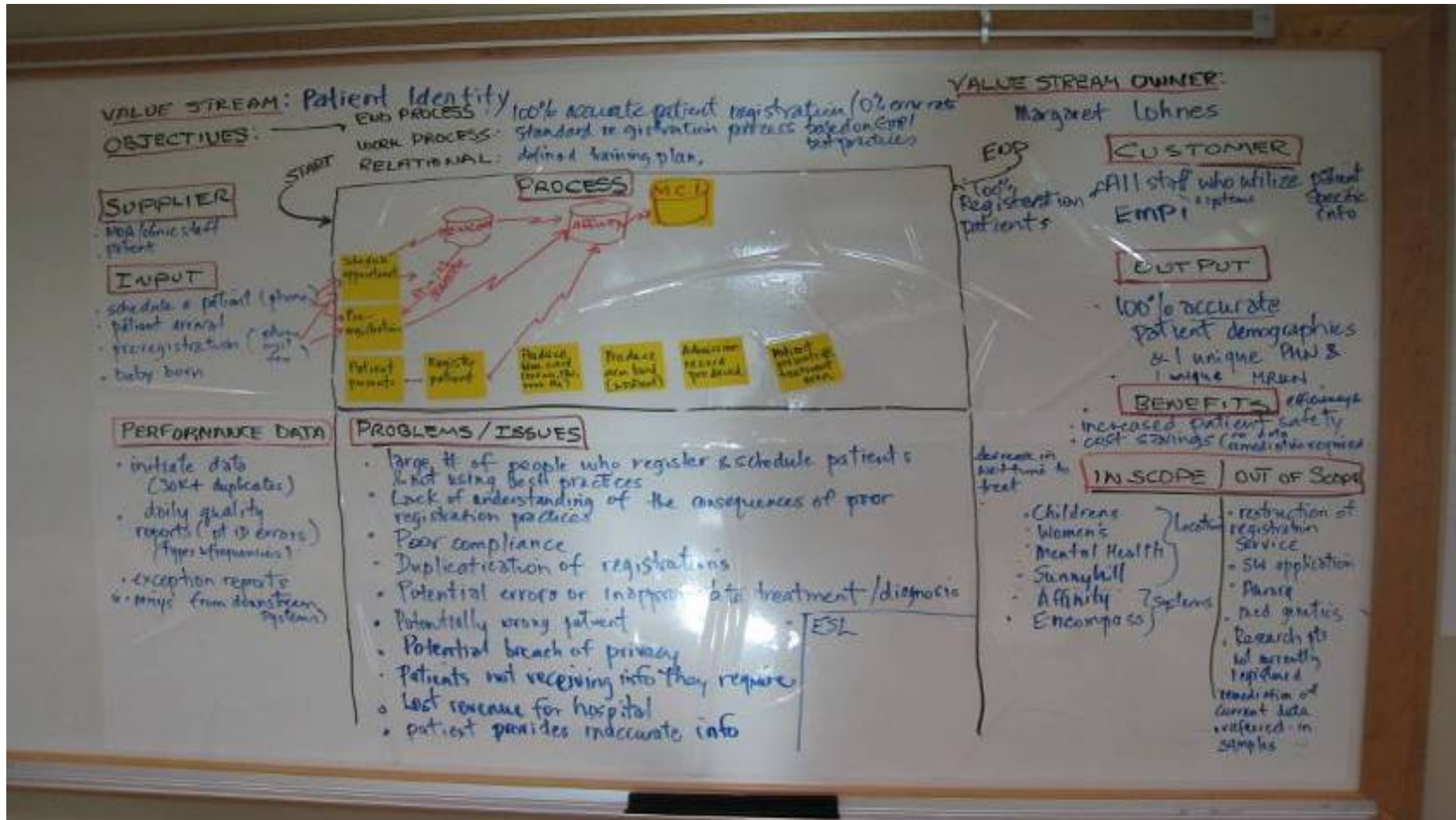
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Value Proposition – Scoping Example



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Value Proposition/Scoping Example



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CUSTOMER
staff who utilize patient specific info
NPI & systems

OUTPUT
% accurate patient demographics & 1 unique PHN & 1 unique MRN

BENEFITS
efficiency & reduced patient safety savings (no data remediation required)

SCOPE | OUT OF SCOPE

Location	• restriction of registration service
alth	• SW application
Systems	• Aurora med genetics
SS)	• Research pts

WORKSHOP:
DATE
TIME
PLACE

PARTICIPANTS *margoliner*

- Sunnyhill / Fan Boyd
- Gerald Yu *DSS*
- Ali Massavi Rizi *DSS*
- Marc Guay *not sure if DSS*
- Bonnie Boa *Admin*
- Michelle Ostom *Prog man*
- Linda Prince
- Betty Kerray
- Lab
- Pharmacy
- Prit Bains - DI *(admin my case)*
- Julia Mark

DECISION PANEL

- Sharon Toohay
- Liz Whynot
- Leslie Arnold
- Nancy Ketani
- David Wensley

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Value Proposition Exercise



For your Selected Case Study

- Develop your Value Proposition (30 min)
- Discuss and Report Out

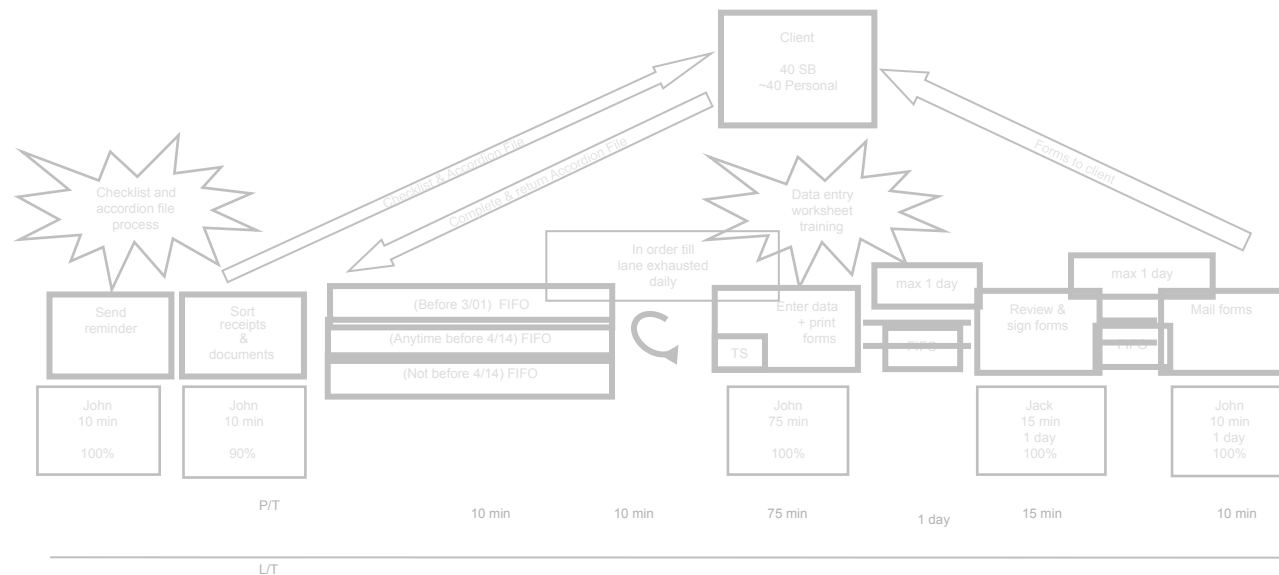
Introduction to Value-Stream Mapping

Current State

What is a Value-Stream Map?



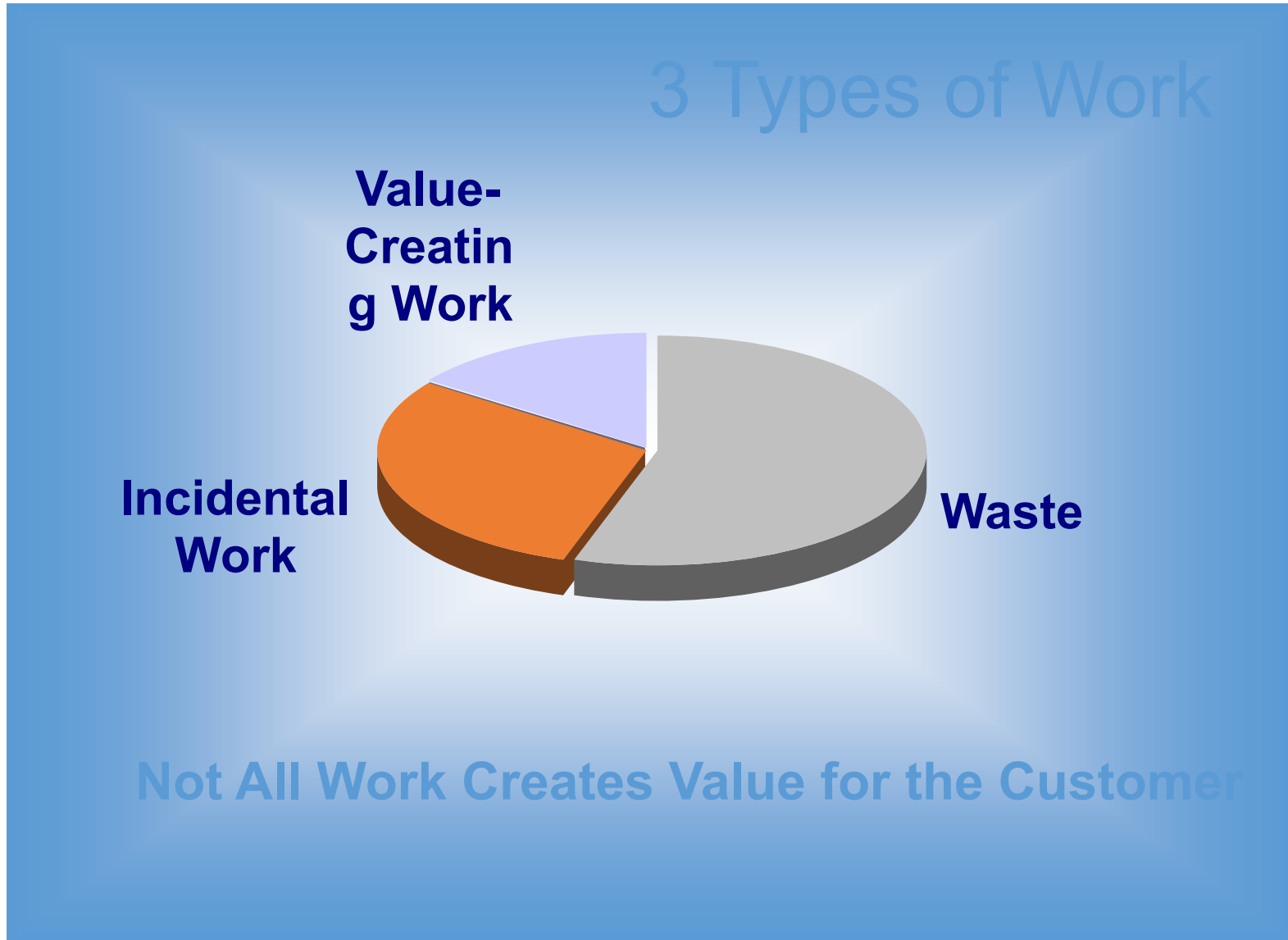
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A Value-Stream Map is a simple tool that visually represents what's going on in a Value Stream in terms of work flow, product transformation and information movement.

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Types of Work



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Customer: A Lean Definition



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The Customer is the person or group of people who use the product, service or information we produce during our work.
They may or may not pay for it.

I am a
customer of
our unit
clerk

We are
customers
of the lab
tech

I am a
customer of
Admitting



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- **The difference is simple but very important!**
- **When it comes to determining if a process is Value Added we must use the perspective of the External Customer.**

Supplier: A Lean Definition

The **Supplier** provides “inputs” that trigger the start of the process or process step.



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Process Time (P/T)

Time spent actually performing the work of the process (step)

Example:

“Hands on time” (P/T)

“Touch time” (P/T)



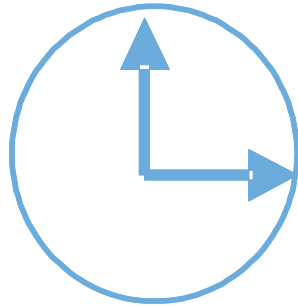
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Delay Time (D/T)* (Inventory)



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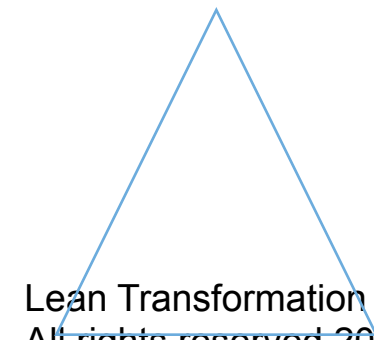
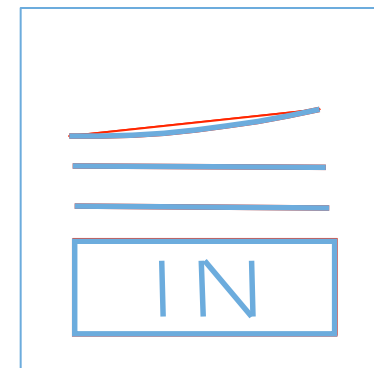
* Also called Wait Time
(W/T)



Can be DURING a
process step

Example: *Waiting for a call
back...*

... or BETWEEN processes (steps)
Example: *Sitting in an
“inbox” - “Inventory”*

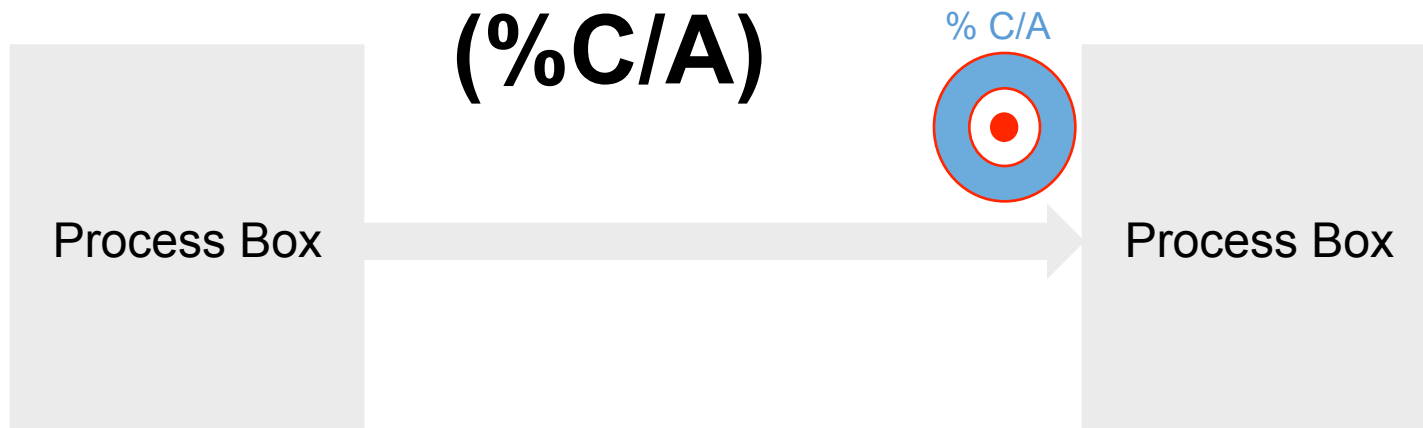


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Percent Complete & Accurate



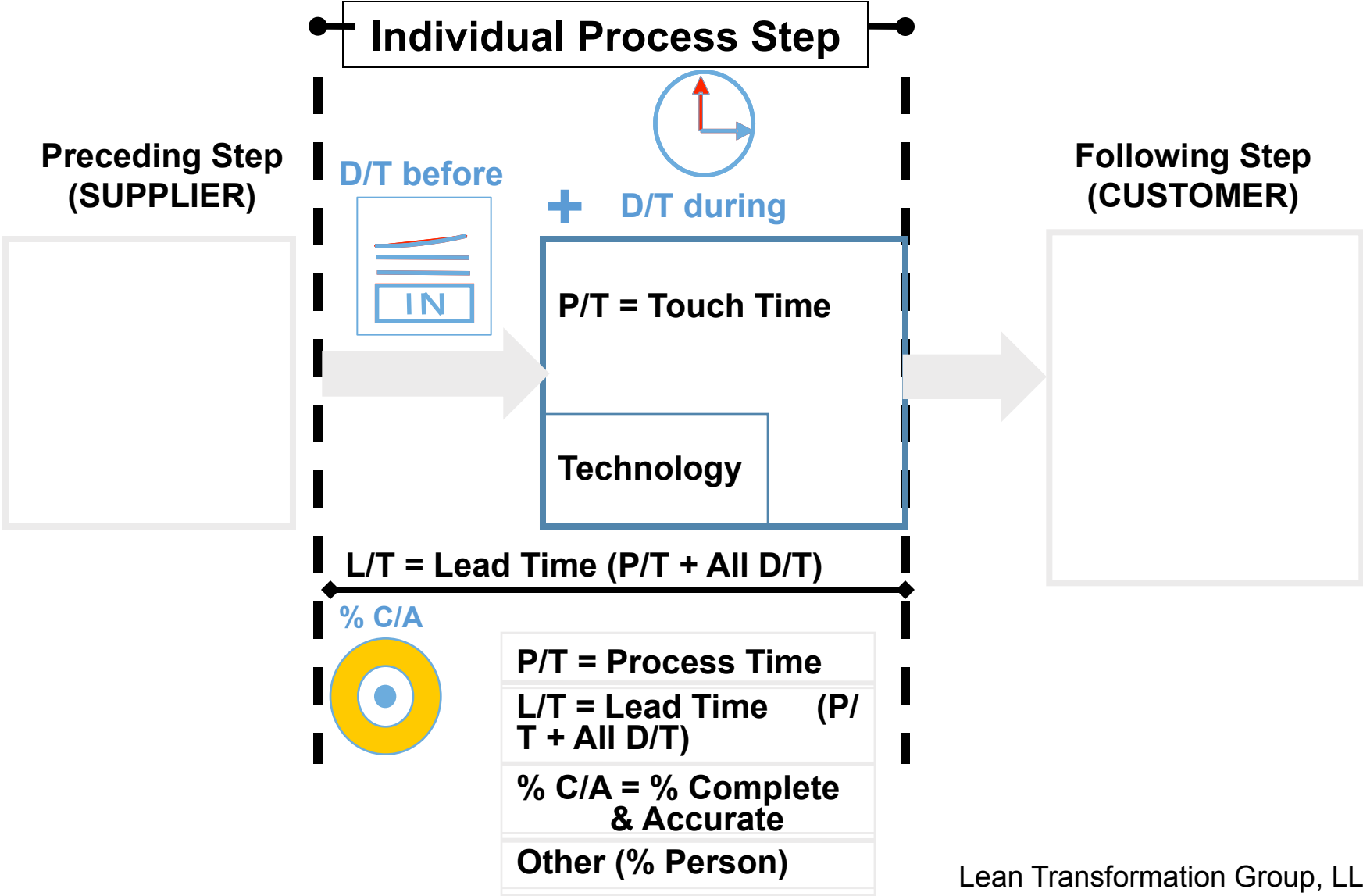
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The percentage of time
the target is hit coming
INTO a process (step) or
FLOWING to the
customer

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Calculating Process Step VS Metrics

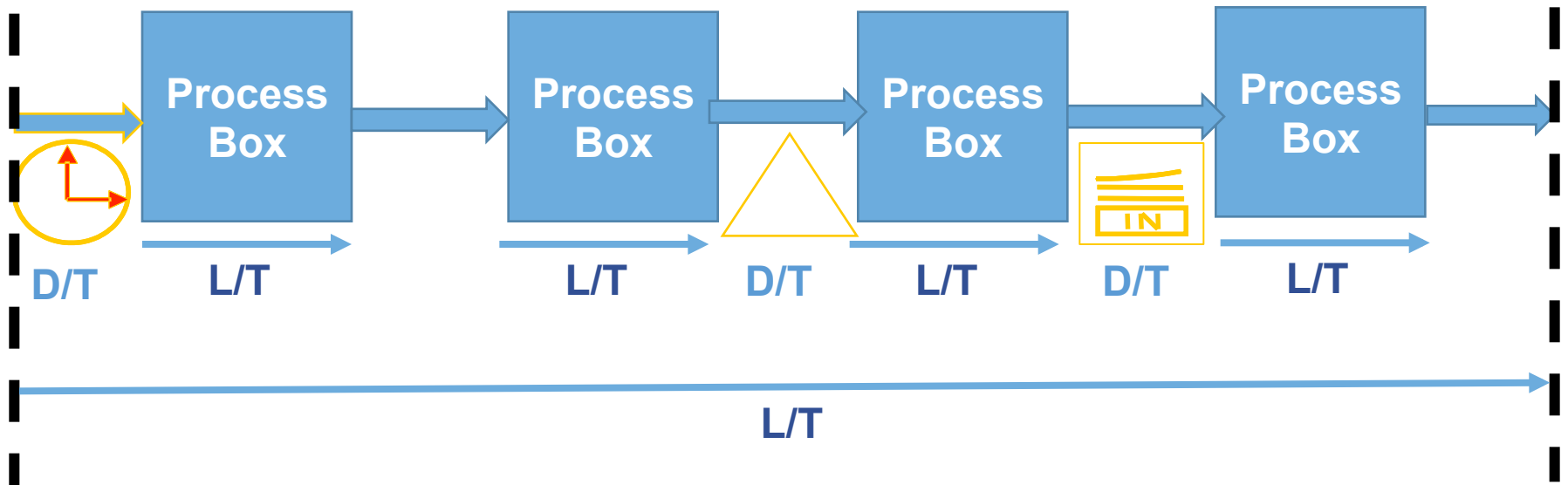


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Lead Time (L/T)

...FINISH TIME

$$L/T = P/T + D/T$$

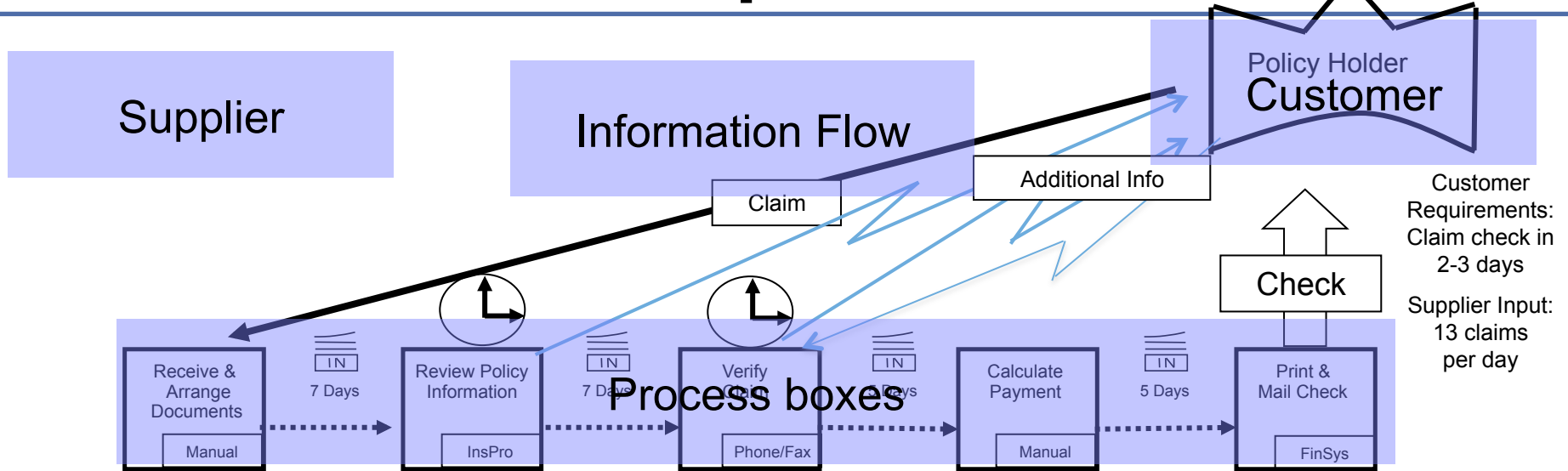


START TIME...

Others to Think About

- % of time available for shared resources
- Yield for process that have scrap issues
- Change over time (C/O)
- Up time for resources (equipment) that are unstable
- Your own metrics that are meaningful to the problems in your Values Streams and Processes

Value-Stream Map Zones



Process data boxes (w/metrics)

P/T = 2 min.	P/T = 5 min.	P/T = 60 min.	P/T = 5 min.	P/T = 3 min.
D/T = 0	D/T = 0-5 days	D/T = 2-10 days	D/T = 0	D/T = 0
%C/A = 99%	%C/A = 80%	%C/A = 50%	%C/A = 99%	%C/A = 75%
Bob's Avail = 20%	Ann's Avail = 20%	Eric's Avail = 50%	Ann's Avail = 20%	Bob's Avail = 25%

Timeline & Summary Statistics (value stream metrics)

P/T	2 min.	5 min.	60 min.	5 min.	3 min.	
D/T	7 days	0-5 days	7 days	2-10 days	5 days	5 days
%C/A	99%	80%	50%	99%	75%	

Insurance Claim Processing
Current-State VSM
05/10/06

Value Stream Metrics

Process Time = 75 Minutes
Lead Time = 26-39 Days
Percent Complete & Accurate = 29%

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1. Note customer and supplier issues:
 - a) *Identify the process output(s) and customer(s) who use the output(s).*
 - b) *Describe quantity and quality requirements and delivery types of outputs to customers.*
 - c) *Add input(s) and supplier(s) of the input(s).*
 - d) *Describe quantity and quality of and delivery type(s) of input from suppliers.*

2. Identify the main process steps in the work flow and map them as process boxes in the order in which they are performed.



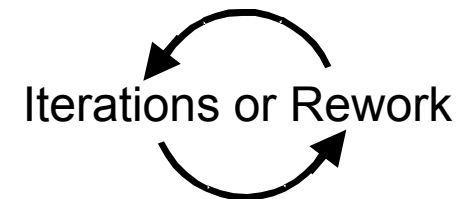
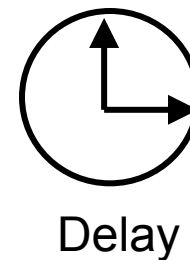
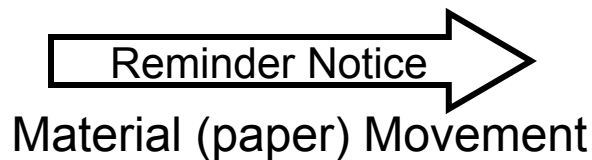
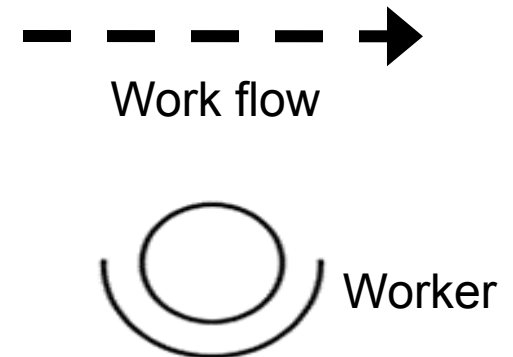
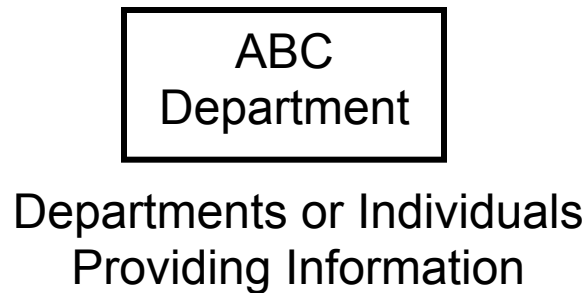
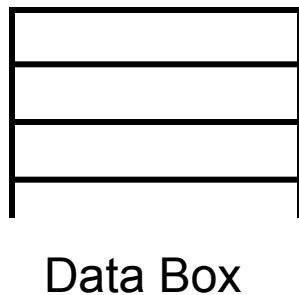
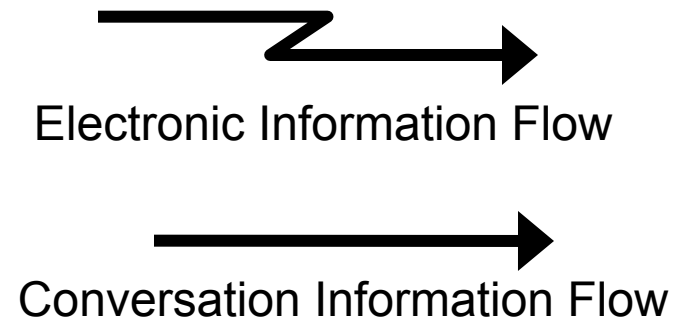
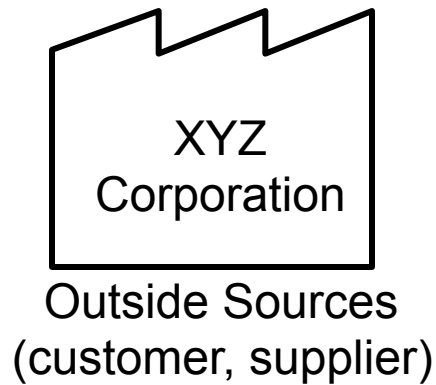
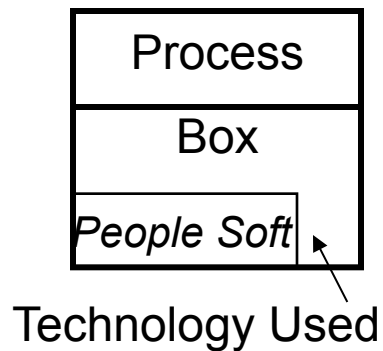
3. Go to the Gemba where possible and add:
 - a) *information flow, including information type;*
 - b) *technology used;*
 - c) *metrics: process time (P/T), delay time (D/T) with queue icons (clocks and in-box icons), lead time (L/T), percent complete and accurate (% C&A);*
 - d) *work priority.*
4. Calculate range process time, lead time (process + wait time), and overall % complete and accurate for the entire value stream. (Option: calculate average P/T and L/T as well as range.)

Current-State Mapping Exercise



- Use the data from your Selected Case Study
- Draw a Current-State Map (30 min)
- Compare maps & discuss

Current-State Mapping Icons



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Reflections

Reflect on your learnings so far:

→ *What have you learned?*

→ *Think about what you know, and*

→ *What you need to know.*



Problem Identification and Future-State Mapping

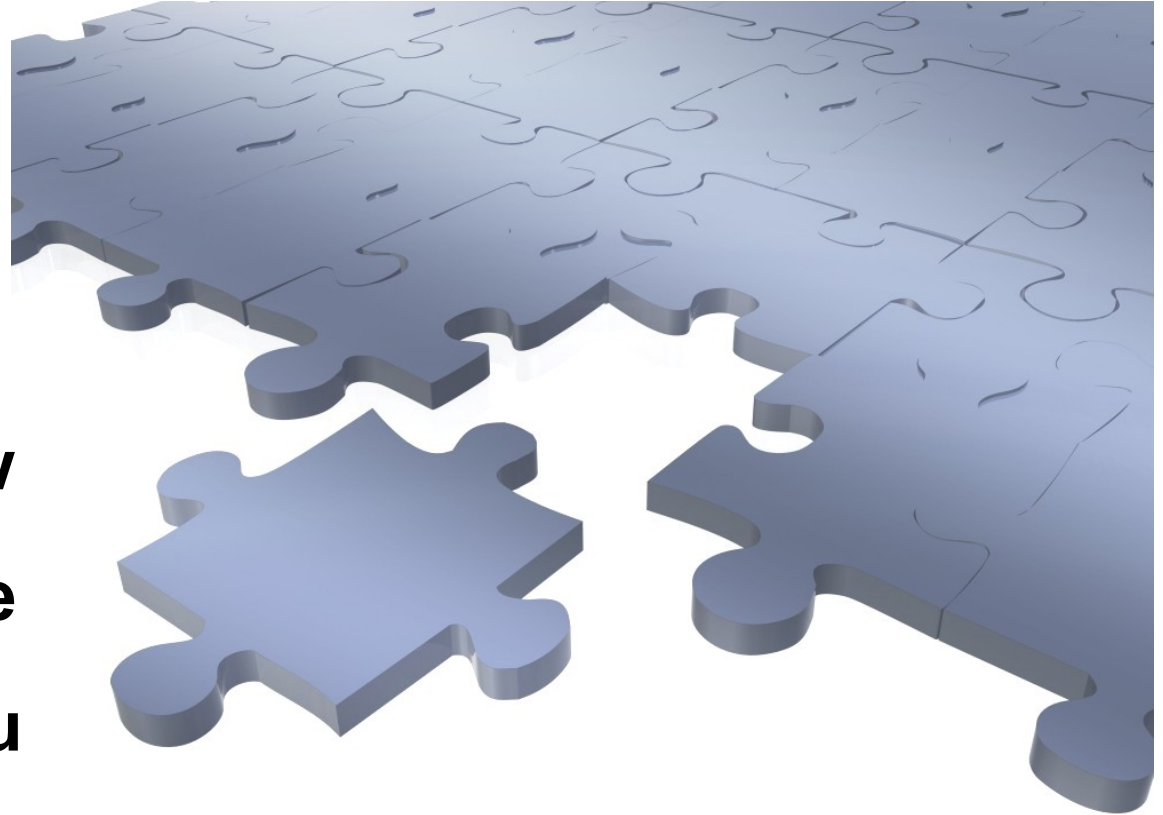
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Problems: A Lean Definition



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In **LEAN terms**, a “problem” is the gap between the way things are now and the way they’re supposed to be/you want them to be in the future.



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Problem Solving in Most Companies



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Solutions Oriented Thinking	We define problems in terms of the solutions we like
Root Cause Analysis	We do not do a very good job of driving to root cause
Problem Area Identification	We are not good at isolating the area where the problem exists
Blanket Solutions	We generally apply a solution across the larger organization
Testing	We often implement without thoroughly testing to see if we have killed the problem
Stakeholders	We do not engage a social organization in the problem solving process, often missing key stakeholders
Implementation	We do not implement with the expectation that plans are simply testing the hypothesis in action and we sometimes ignore key data for validation or countermeasures

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Examples of Superficial/Incomplete Problem Statements

- University Medical Researcher - “The problem is that I need more clerical help”
- CEO of an international consumer product company – “The problem is we need more BIG ideas from our marketing department”
- CEO of a high tech company “ If we have a leadership problem, I will fix that”
- Manager of Finance in a large international company – “We need to leverage some common resources across some of the other value streams”
- Manager of Product Development – “We need better definition of what to develop from Marketing”
- Nearly every manager – “We need to re-organize”

How Problem Solving Fits into the Value-Stream Improvement Project

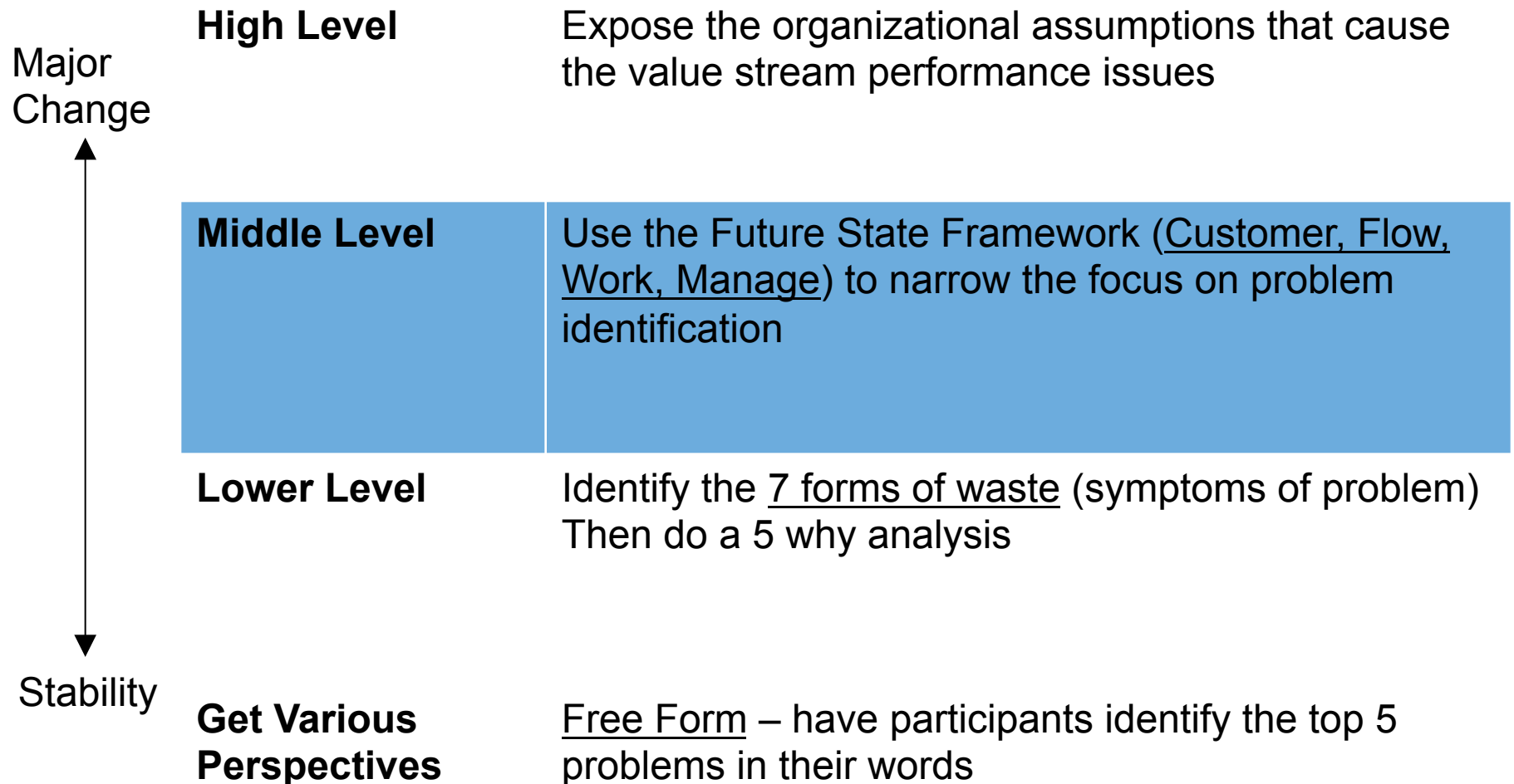


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- Problem Solving is “In the Air “ and is happening at all level and all people
- The Value-Stream Improvement Process is a specialized problem solving process that is designed to improve communication between Value creators, the middle level of the organization and leadership by exposing both system and process level problems
 - Focuses on the primary value streams that provide value to customers
 - Provides a way of engaging the people inside your organization to solve problems of the value stream they are working in
 - Develops a framework for measurements so that people to see the improvements they are making

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Analyze the Current State



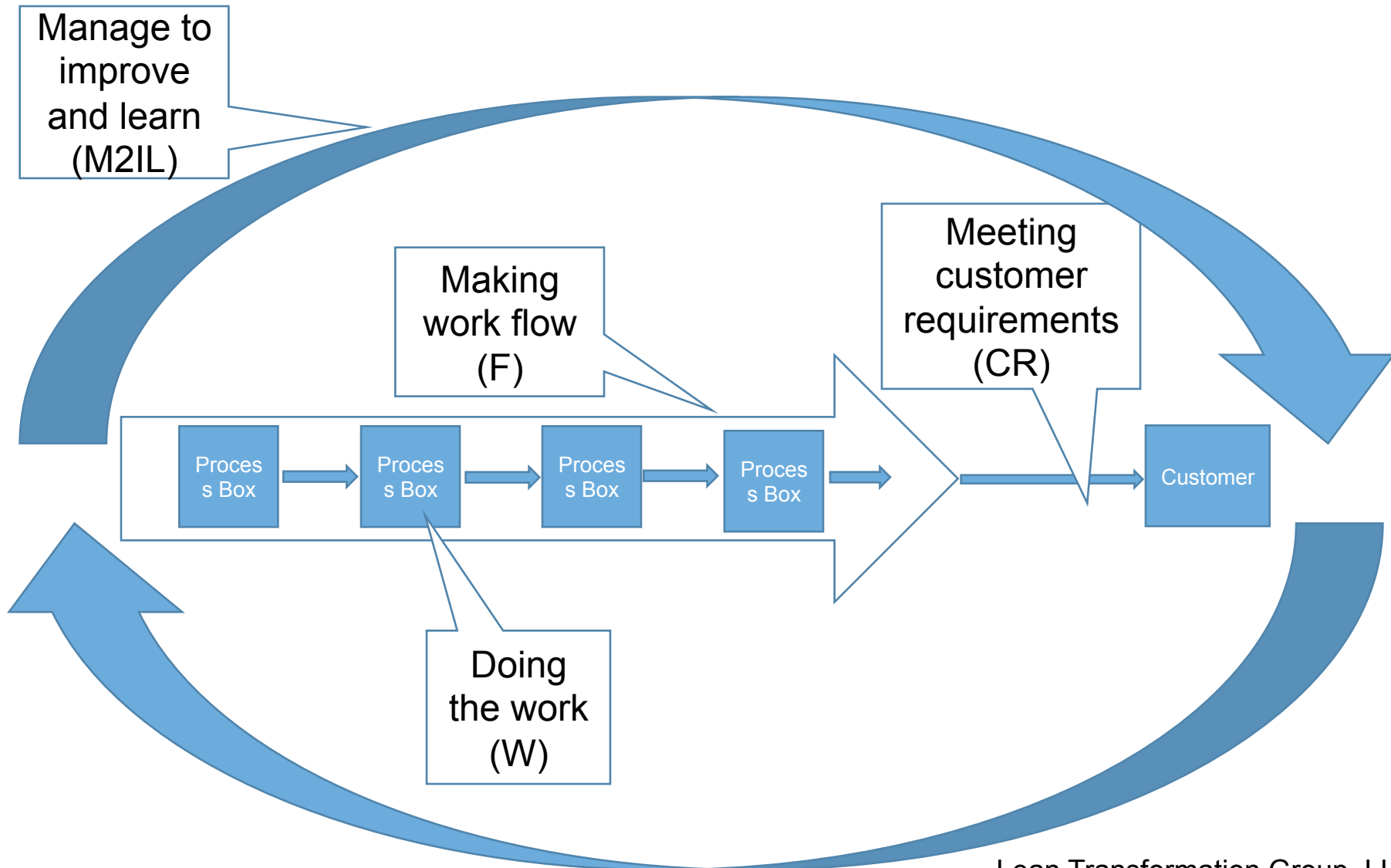
7 Types of Waste

- Waste of CORRECTION
- Waste of OVERPRODUCTION
- Waste of MATERIAL MOVEMENT
- Waste of MOTION
- Waste of WAITING
- Waste of INVENTORY
- Waste of PROCESSING
- Waste of unevenness (Systemic)
- Waste of overburden (Systemic)

Value-Stream Problem Categories



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(CR)

Typical Problems

- Overproduction – giving the customer something he/she is not willing to pay for or doesn't need
- Not meeting the timing needs (OTD)
- Not meeting the quality expectations (%C&A)
- Not meeting response needs (L/T)
- Others?

Making Work Flow (F)

Typical Problems

- Waiting/delay
- Rework
- Excessive handoffs
- Interruptions
- Many requirements for decisions and approvals
- Poorly defined requirements
- Different work, common process
- Expectations too high
- Others?

Doing the Work (W)

Typical Problems

- Lots of rework
- Passing along work without checking for completeness and accuracy
- Standards not being followed (workarounds) or no standards
- Others?

(M2IL)

- Typical Problems
- No reviews
- No management corrective actions process, until too late
- Many review but no corrective actions
- Limited reuse of existing information
- Learning not integrated in the process
- Others?

Problem Identification Exercise



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In your Selected Case, identify the problems in your Current-State Map (15 Minutes)

- Individually, list 5 problems by category on a post-it note, one per problem
- Label each as CR, F, W, or M2IL and place on your CS map
- Compare maps & discuss (30 Minutes)

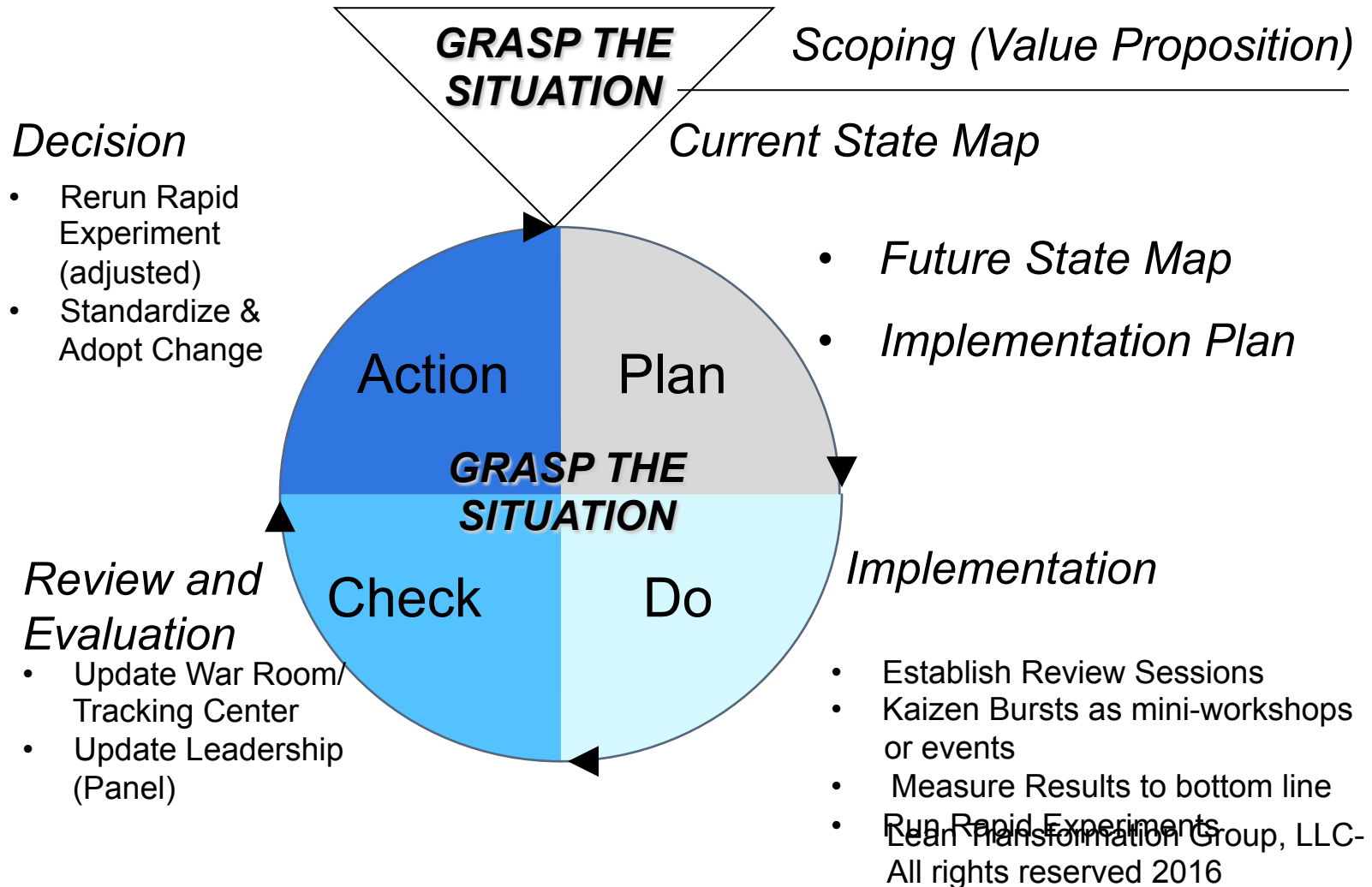
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VSI Phases Using the PDCA Cycle for Managing Continuous Improvement



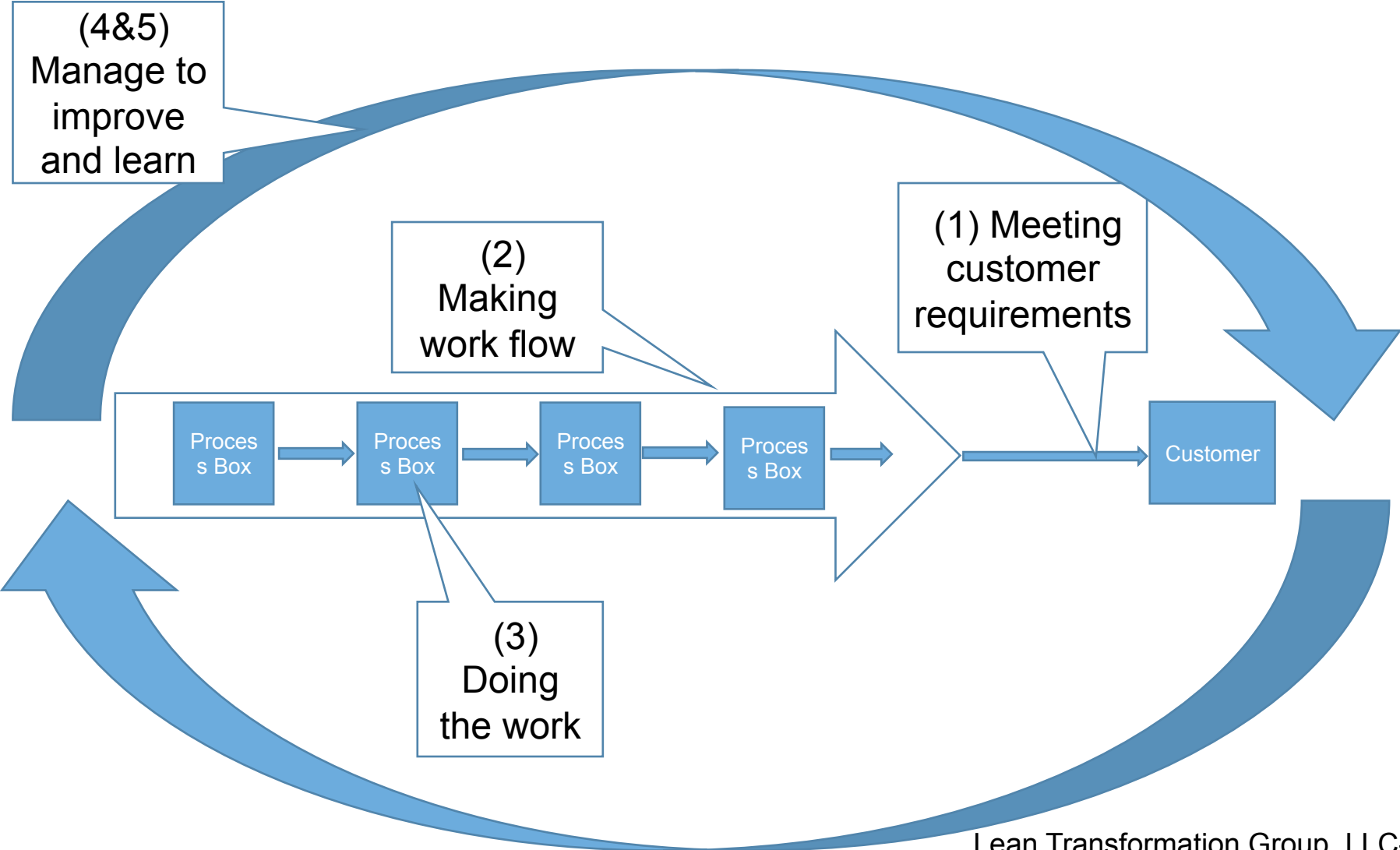
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Pre-Scoping (Leadership Alignment)



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5 Steps for Designing Future State Value Streams



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1. Define Customer Requirements

- Confirm the End Customer's specific requirements.
- “Chunk” the entire Value Stream.
- Confirm each Internal Customer's requirements to proceed with his/her work.

– Determine the Scope of revision required

2. Design a Process to Make the Work Flow

- Combine steps.
- Adopt Service Level Agreements/Proceed Until Halted.
- Add other Lean Tools.
- Adjust Rules for Prioritizing Work between steps.

3. Improve Work Quality and Reliability Within the Process Steps

- Implement Repeatable Work Procedures & Standards
- Ensure Quality is Built in at the Source
- Introduce Visual Communication & Management

4. Design to Manage for Improving & Learning

- Identify performance indicators for the chunks, create process tracking tools, use milestones & major handoffs to pace the work.
- Schedule regular checks of process tracking data for problem solving.
- Hold formal review & reflect sessions at key points.
- Capture lessons learned & use to make continued improvements.

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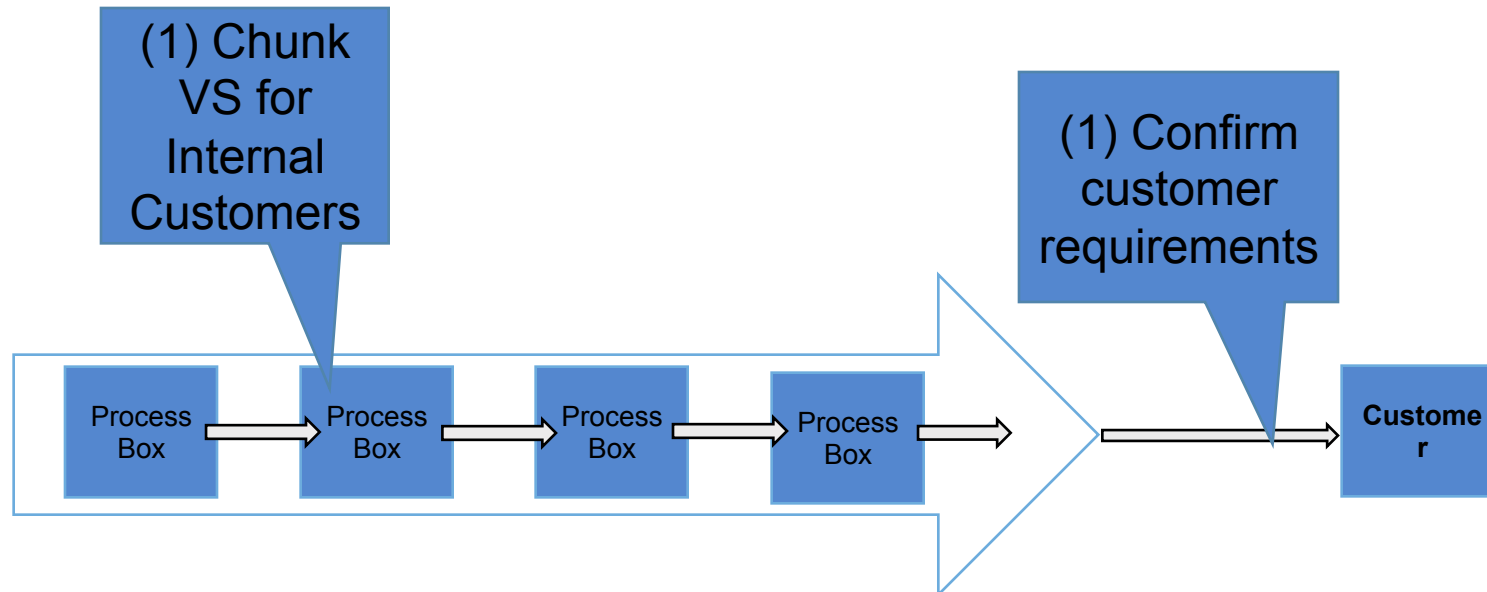
5. Estimate Your Results.

- Estimate quality and process improvements (% CA, P/T, L/T)
- Identify changes in resources required

Step 1 – Define Customer(s) Requirements



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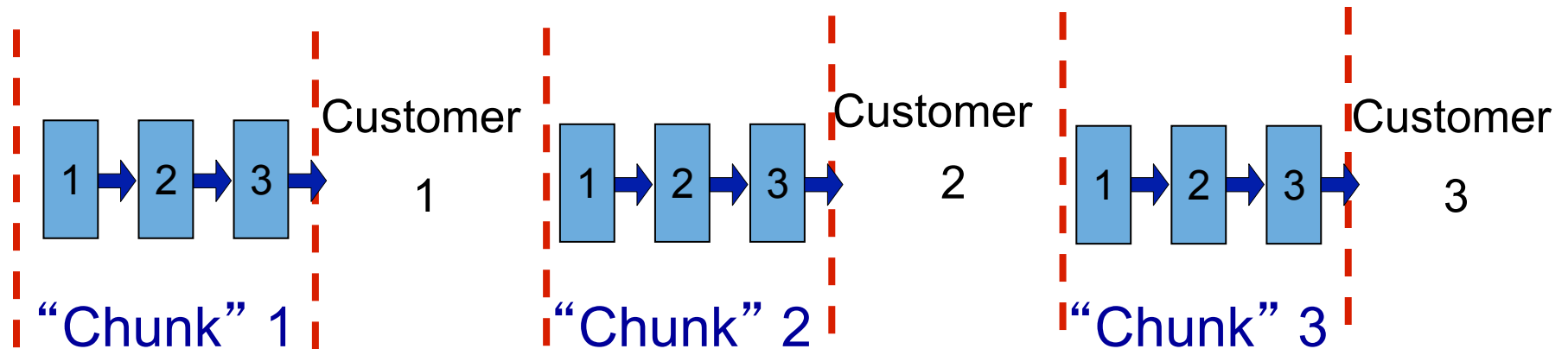
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How to Define “Chunks”

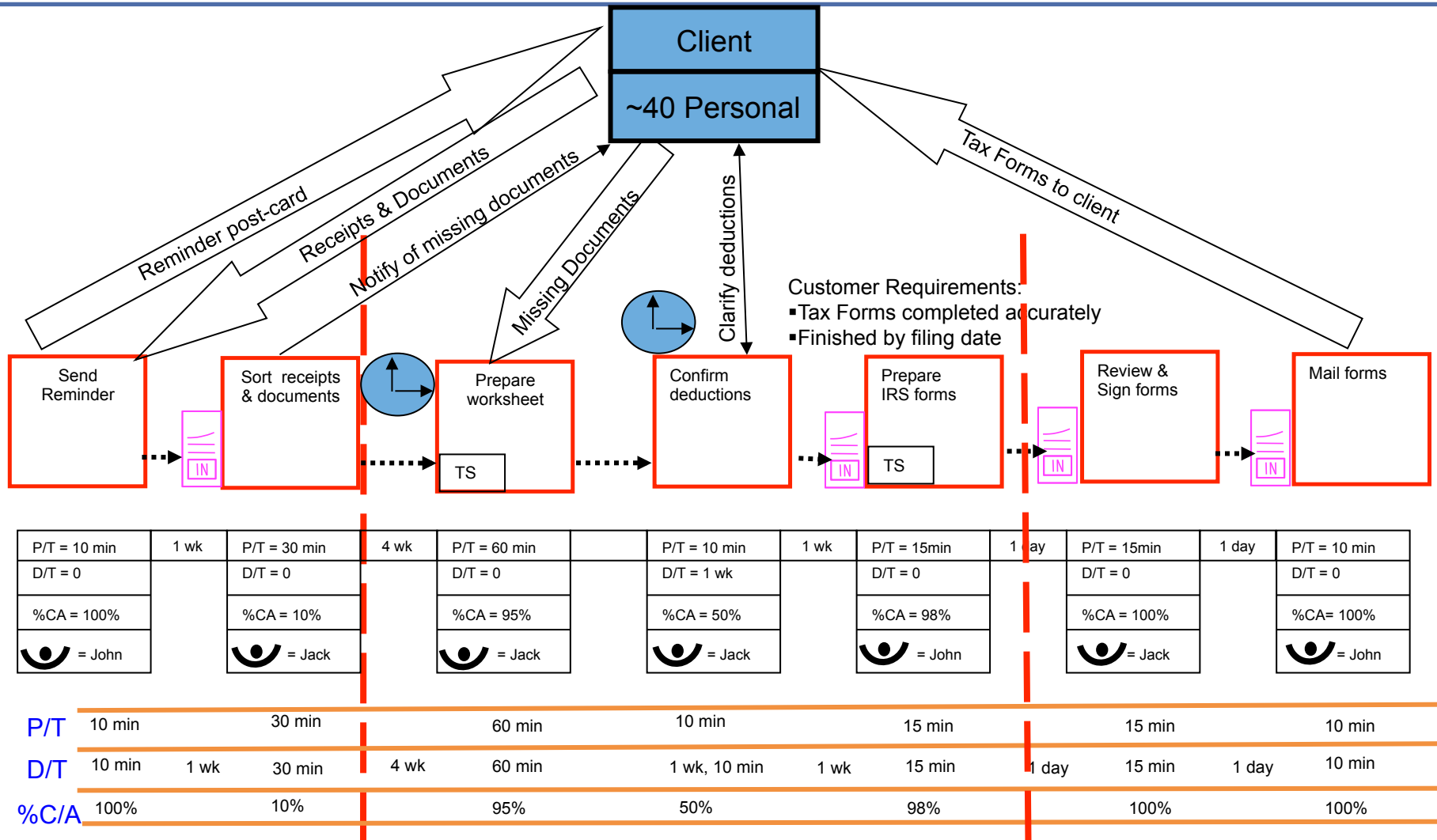
Take a big picture view –

- Look for the major transformations in creation of the “product”
- Look for changes in the nature of the work or who (person or group) is creating the transformations

Then, chunk the process flow based on the key points of handoff in the sequence of transformations

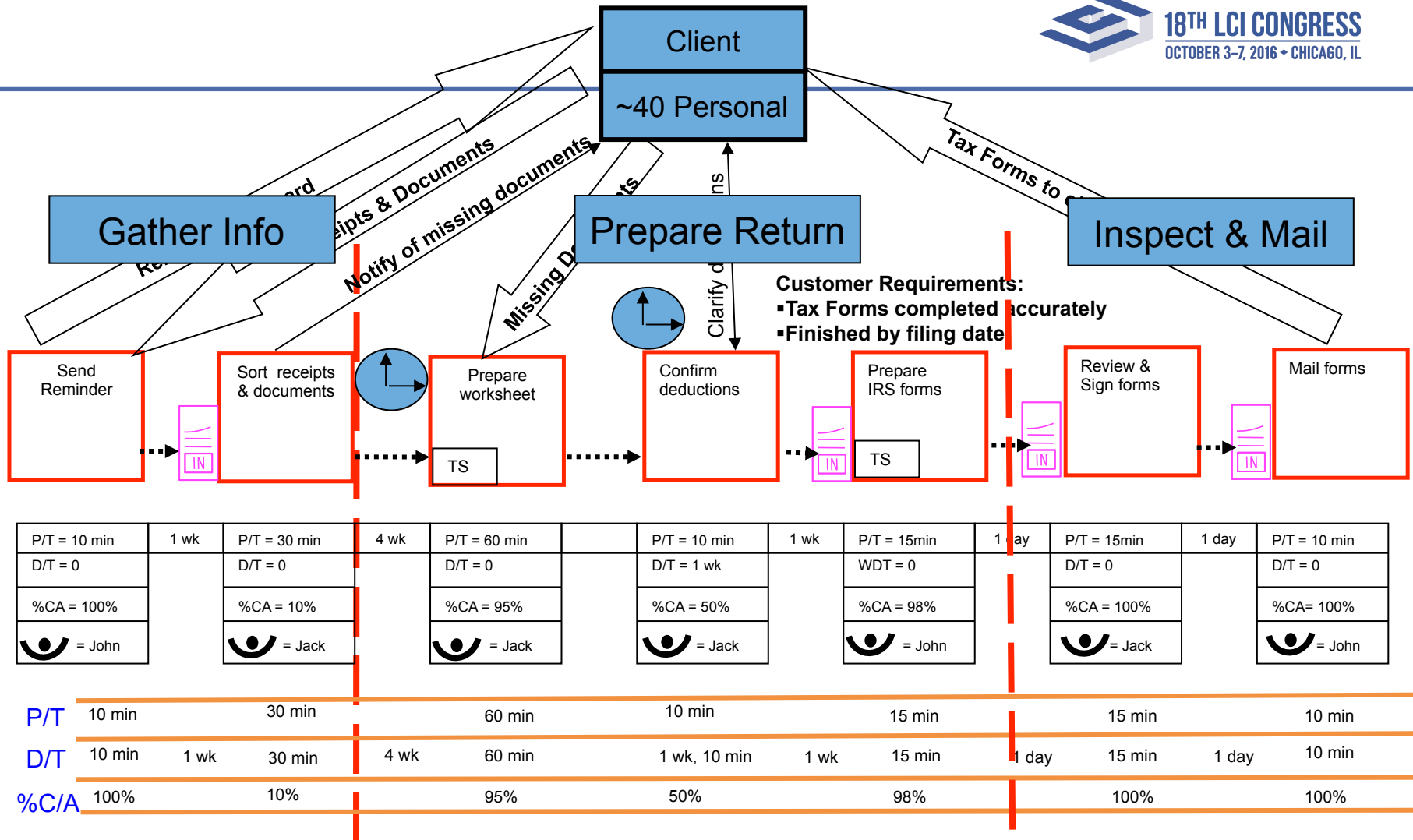


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Value Stream Metrics	
Process Time	= 150 min
Lead Time	= 7 wks, 2 days, 150 min
Percent Complete & Accurate	= 4.7%
On Time Delivery	= 95%

Current State – Jax Tax
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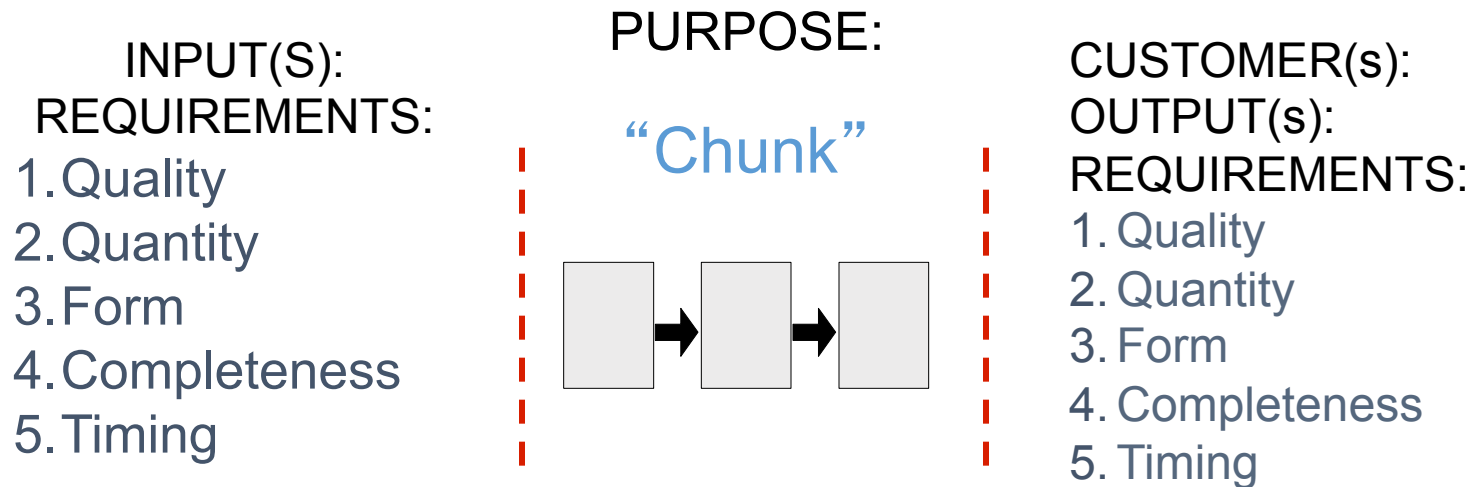


Value Stream Metrics	
Process Time	= 150 min
Lead Time	= 7 wks, 2 days, 150 min
Percent Complete & Accurate	= 4.7%
On Time Delivery	= 95%

Current State –Jax Tax
05/10/14

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“Chunk” (Who, what, when, how many, why, etc.?)



- Define Purpose, i.e., why the work is performed
- Define the Internal Customer Requirements for Outputs at each key point of handoff
- Define the Input Requirements for the Chunk

Requirements Document— Jax Tax Example

Chunk: Prepare Return
PURPOSE: Enter
required info into tax
software/print completed
forms

Inputs & Reqs:

1. C/A info re
income,
expenses,
deductions, etc.
2. Desired filing
date

Features:

Customer:

Inspect & Mail

Output(s):

Hard copy of
completed tax
forms

Requirements:

1. 100% CA
2. 1 day TAT

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Requirements Document— Manufacturing Example

Inputs & Reqs:

Molded comps
Purch comps
Sub Assem Comps
WI
Gages
Manufacturing Order
Operators
Equipment

PURPOSE:
FINISHED GOODS

Features:

Customers:

Shipping
FG Warehouse
Molding
SubAssem

Outputs & Reqs:

100% On Time Delivery
100% Quality\WI
Shippable Goods

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Chunking Exercise, Part 1



- Determine Chunks of the Value Stream and identify the Purpose for each (30 Min)
- Create the a **Requirements Document** for each of your Chunks, including the Chunk Outputs, Customers, and Inputs--starting with your chunk that delivers to your customer
- Report Out (5 Minutes/team)

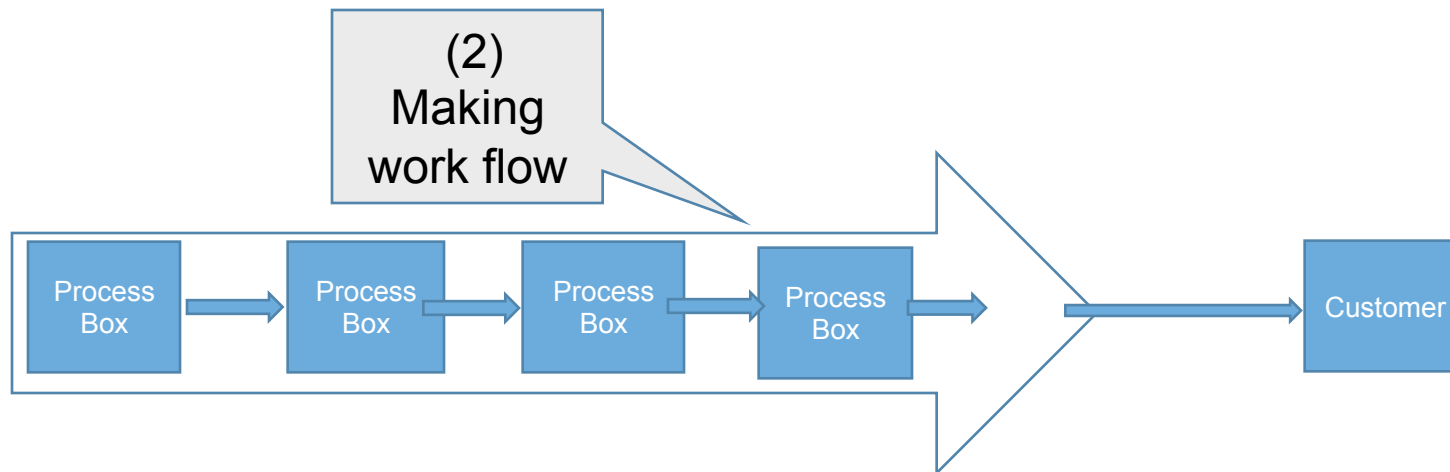
Charting a Course for Your Future-State Map

**RADICAL RE-DESIGN
OR
INCREMENTAL CHANGE?**

**A FEW
CRITICAL STEPS
OR THE WHOLE ENCHILADA?**


Step 2 –

Design a Process to Make Work Flow



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How to Assure Delivery



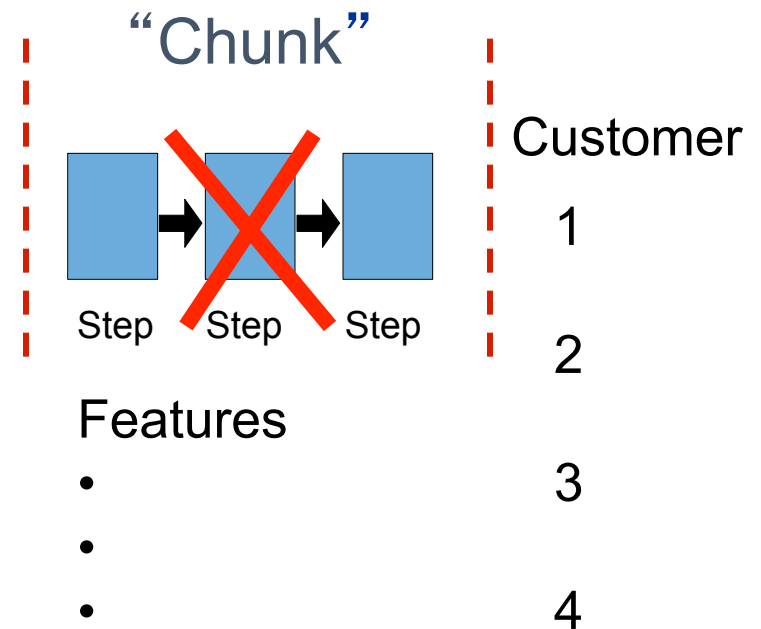
FLOW

- **as much as possible,**
- **as continuously as possible, and**
- **with as much first-time quality as possible**

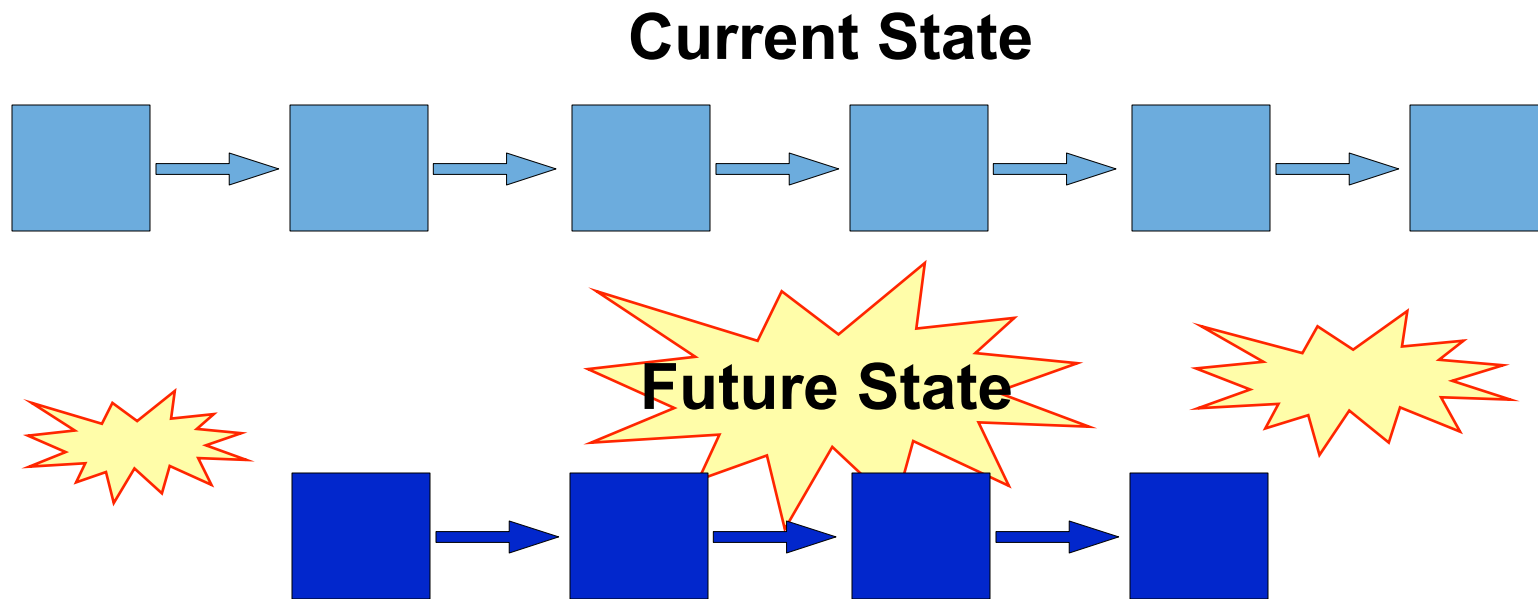
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Define Critical Process Steps for Each “Chunk”

- Identify the basic value creating Steps required to transform the input coming to the Chunk (from its supplier) into an output that meets the customer requirements of next Chunk
- Describe the critical Features that the work situation in the Chunk and those who perform the work must have to produce an output that meets the customer requirements of the next Chunk



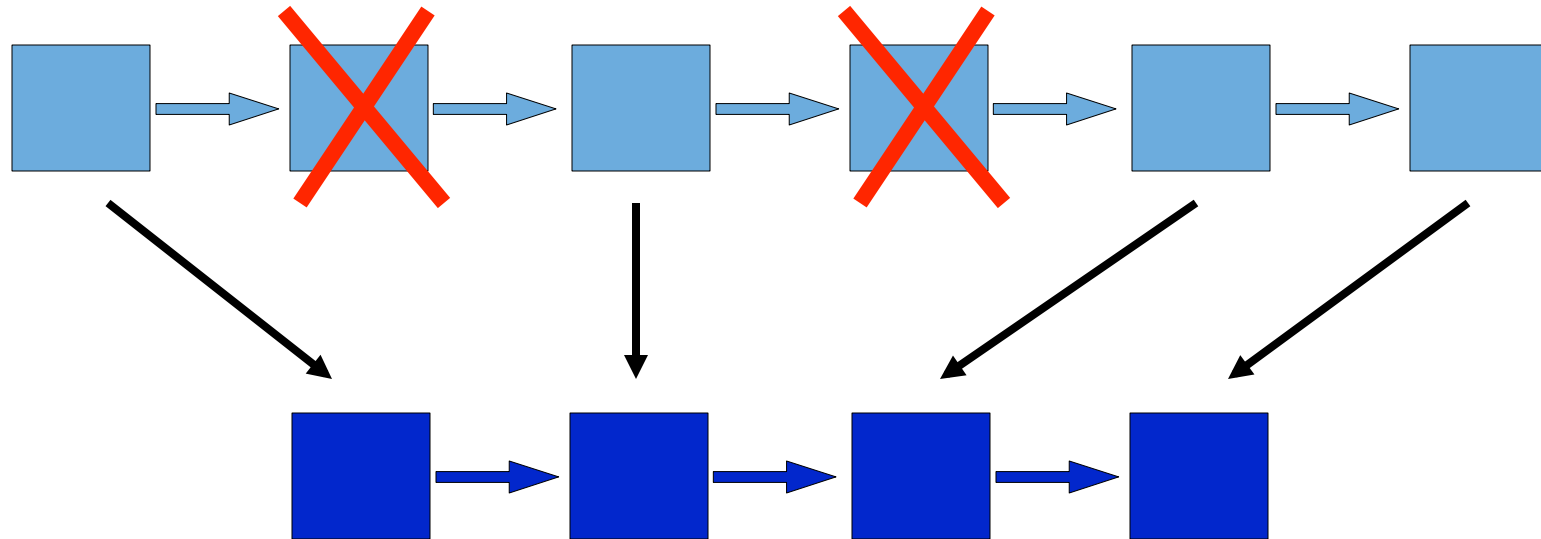
Flow: Reducing Handoffs



What happens to system lead time, quality, and process time when there are fewer handoffs?

Reducing Handoffs: Option 1

Eliminate the task or combine tasks!



Examples:

Calling for room number

Duplicate paper and electronic filing

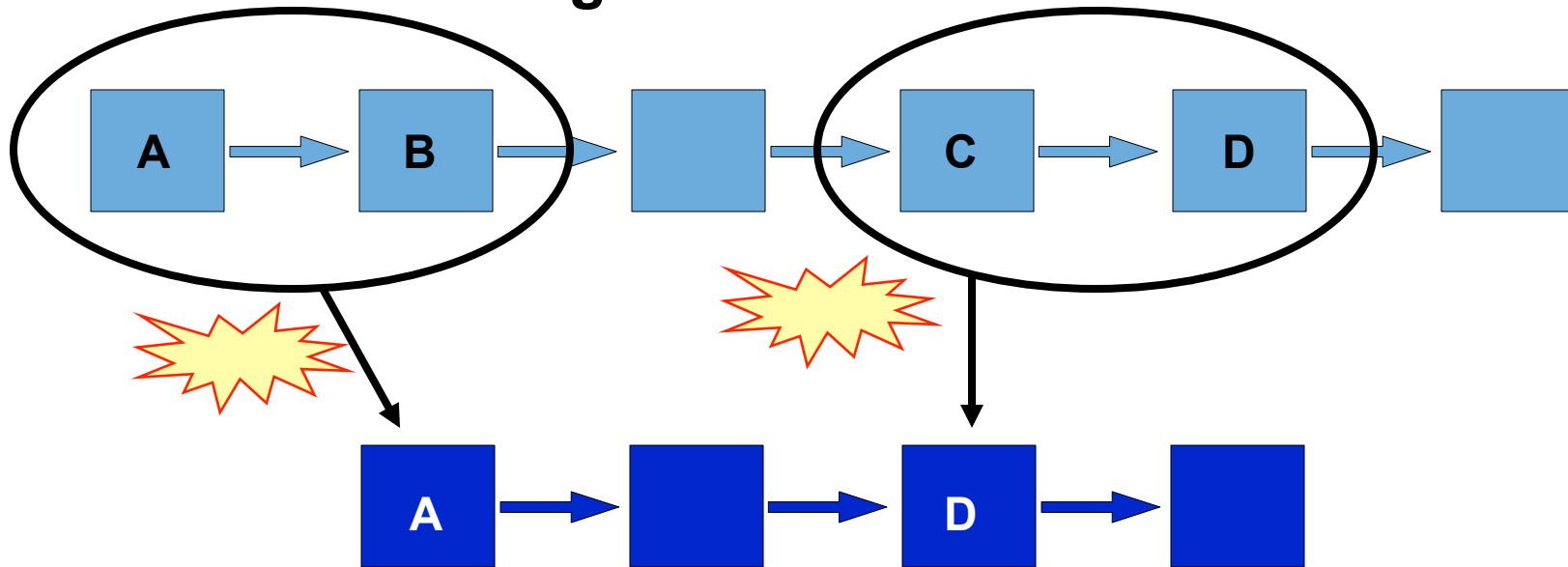
Scheduling follow up appt. on discharge

Others?

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Reducing Handoffs: Option 2

Flex to changes in demand--Cross Train!



Examples:

Pt. transport by staff instead of central transport

Central scheduling vs. dept. scheduling

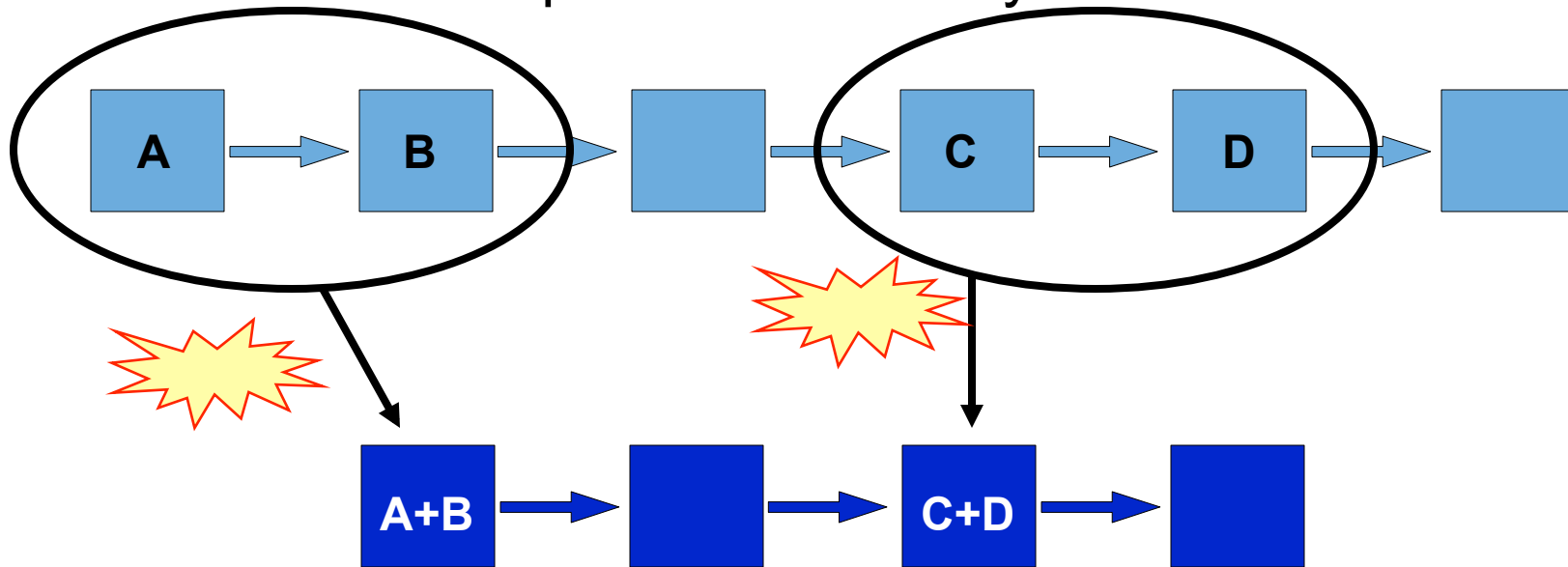
Others?

Reducing Handoffs: Option 3



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Perform steps simultaneously--Co-Locate!



Examples:

Team Assessment vs. Individual Assessment

Team Triage and Registration (simultaneous)

Others?

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Service Level Agreement



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45 minutes max

Between MD and Radiology



ClipartOf.com/1089749



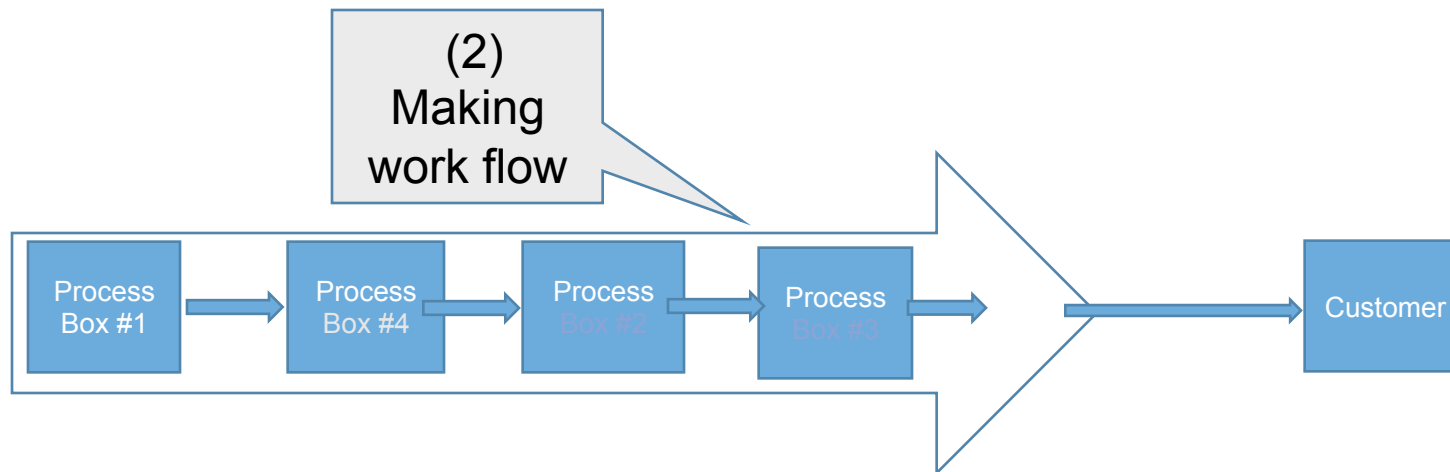
90 minutes max

Between ED and Transport



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Re-sequence Steps



Lean Solutions to Problems in the Current Process

Problem

- Too many hand offs
- Variations in customer requirements (job size, complexity, due dates, etc.)
- Fluctuations in demand
- Waiting for decisions/ approvals

Solution

- Combine steps
- Separate standard process from "special" work routes, establish Service Level Agreements
- Standardize tasks & adjust workloads to pace
- Adopt "proceed until halted"

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Lean Solutions to Problems in the Current Process

Problem

Solution

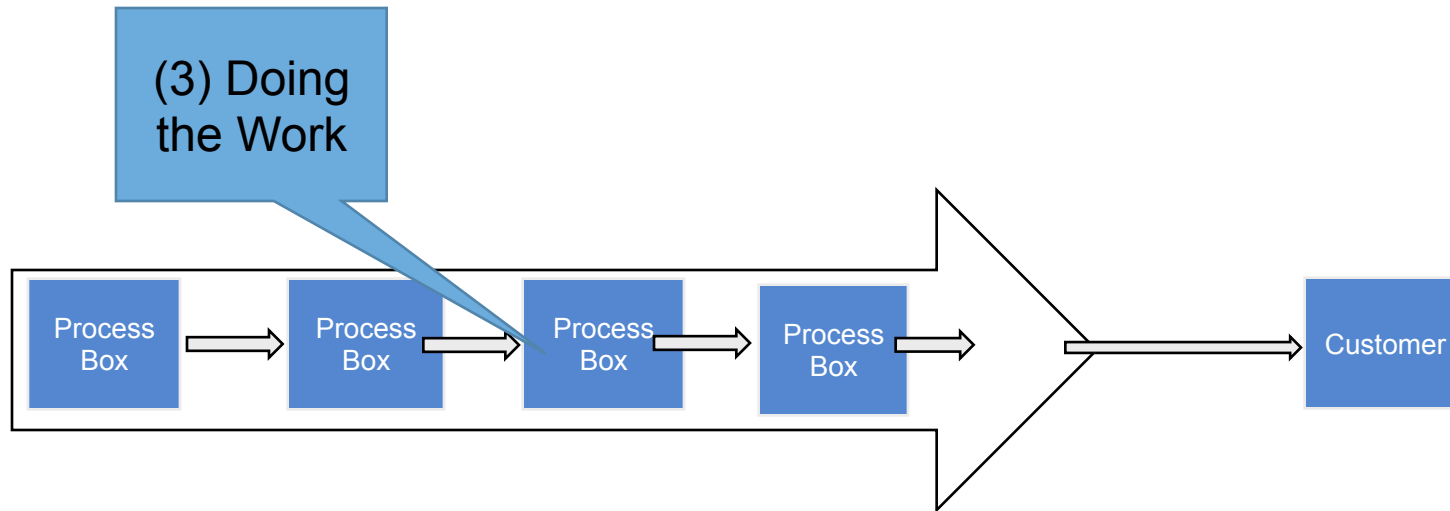
- | | |
|--|---|
| <ul style="list-style-type: none">• Long queues | <ul style="list-style-type: none">• Establish "supermarkets" & pull |
| <ul style="list-style-type: none">• Interruptions | <ul style="list-style-type: none">• Manage interrupts with "freezes"• See "Doing the Work" |
| <ul style="list-style-type: none">• Rework | <ul style="list-style-type: none">• Feedback understanding of |
| <ul style="list-style-type: none">• Poorly defined requirements across all functions | <ul style="list-style-type: none">requirements to Customer for confirmation across functions |

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Step 3 - Improve Quality and Reliability within the Process Steps



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Step 3

Improve Work Quality & Reliability

Critical Questions

1. How can I structure the work inside the process step to deliver 100% C/A to my downstream customer 100% of the time?
2. How can I spot problems immediately?

Key Lean Concepts/Tools

1. Implement Standard Work
2. Build in Quality at the Source
3. Introduce Visual Management

Value

From the perspective of the customer

Flow

*No waiting
No rework*

Work

*Standardized
Built-in quality*

Managing for Improving & Learning

*Milestones and Checkpoints
Learning embedded*

Standards First

- Set Output STANDARDS (for quality, timing, quantity, etc.) first
- Then develop STANDARD(IZED) work as appropriate to ensure standards are met

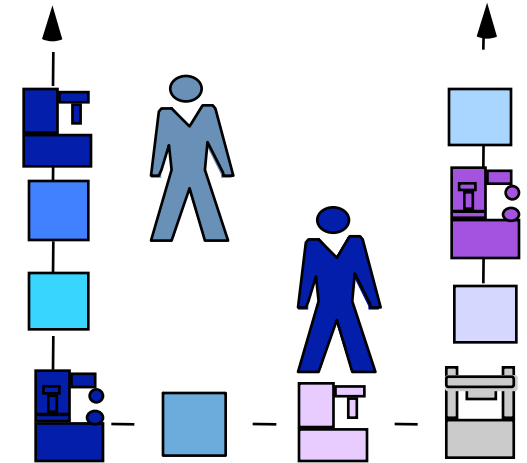
Standard Work: Definition



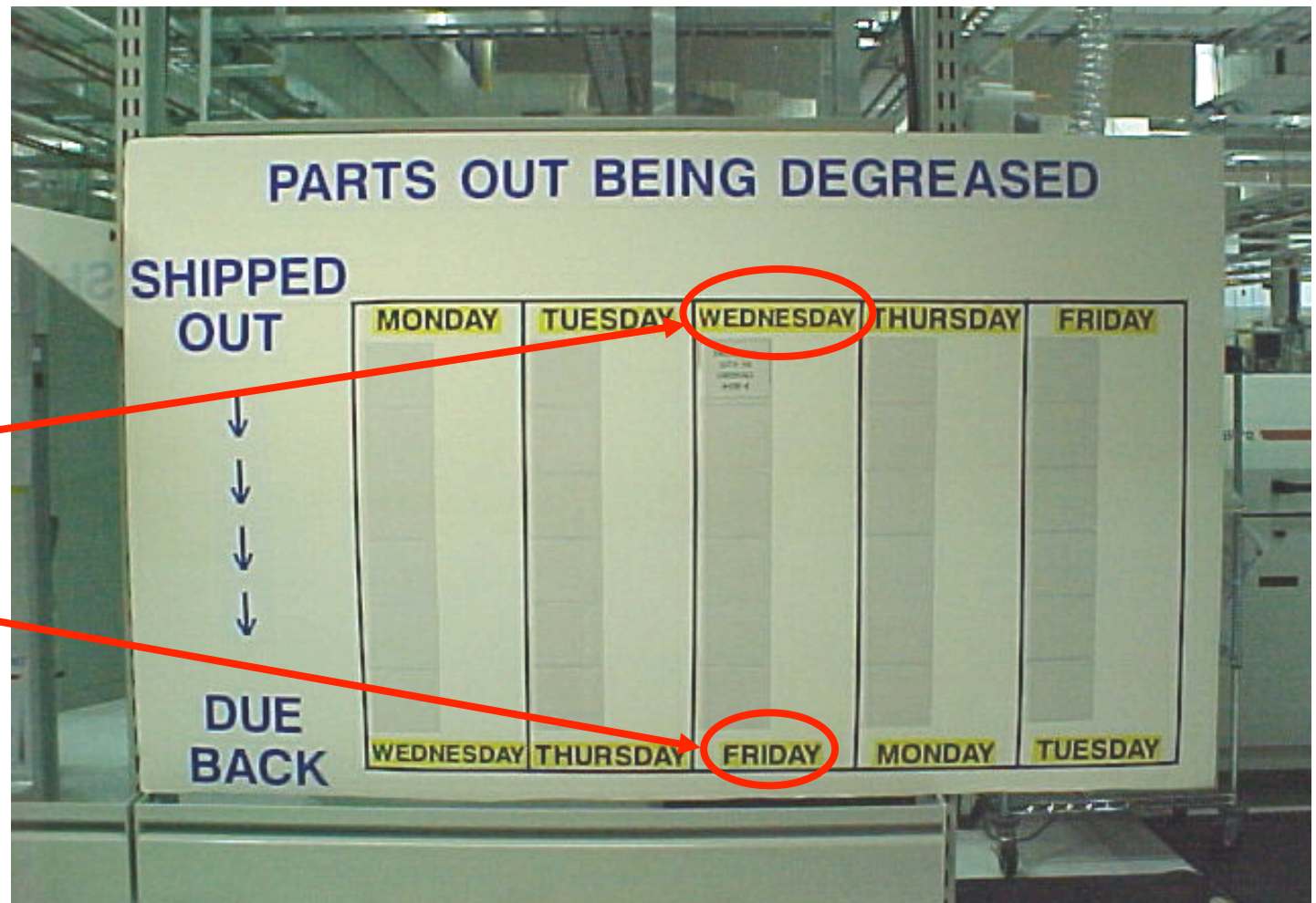
- An agreed upon set of work procedures that establish best sequences for each process
- Doing a job by the best current method to meet customer demand
- A basis from which continuous improvement can take place
- Considers standard sequence, standard time and standard WIP
- Provides a basis to understand capacity

Standard Work: Benefits

- Makes work repeatable without time being wasted figuring out how it should be done each time
- Stabilizes a process, enabling quality in the process step
- Is critical for effective training and cross training
- Enables job rotation & workload balancing
- Incorporates visual management to show normal vs. abnormal instantly
- Is a tool for effective problem solving
- Provides baseline for continuous improvement



Two-Day Service Level Agreement 18TH LCI CONGRESS OCTOBER 3-7, 2016 • CHICAGO, IL



When the parts left
and when they are expected back

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1-day Service Level Agreement With Leveling



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LC-

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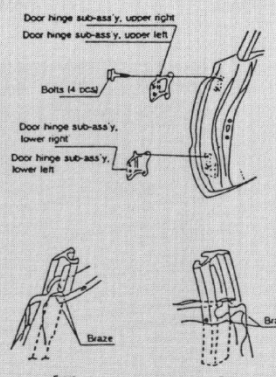
Standardized Work

Process 7 | Process name Rr. Door Assembly | Operation Standards Sheet

Operation | Operation name Hinging, Brazing

DATE: 23 Aug. 3

1	Identify model name, and depress instruction button. * Depress correct button.
2	Set rear door assembly. * Do not hit the door with the assembly. * Hold each all supported grades with both hands.
3	Set upper and lower hinges. * Set on reference pins.
4	Depress "Hinge clamp start" button. * Use right hand.
5	Hold impact wrench and bolts (1). * Put bolts in right hand, impact wrench in left hand.
6	Tighten bolts. * Tighten to correct torque. Do not braze bolts.
7	Pick up blowpipe, fire it, and pick up brazing rod. * Wear welding spectacles.
8	Braze frame front side. * Avoid excessive welding, insufficient welding and pinholes.
9	Braze frame rear side. * Avoid excessive welding, insufficient welding and pinholes.
10	Return blowpipe and brazing rod.
11	Depress "unlock" button. * Use right hand.



Door hinge sub-assy, upper right
 Door hinge sub-assy, upper left
 Bolts (4 pcs)
 Door hinge sub-assy, lower right
 Door hinge sub-assy, lower left
 Braze
 Front
 Rear

Use arm covers, wrist supports, welding spectacles, earplugs, harness.
 Safety check
 Qualifications: Acetylene welder.

Operation Standards Sheet

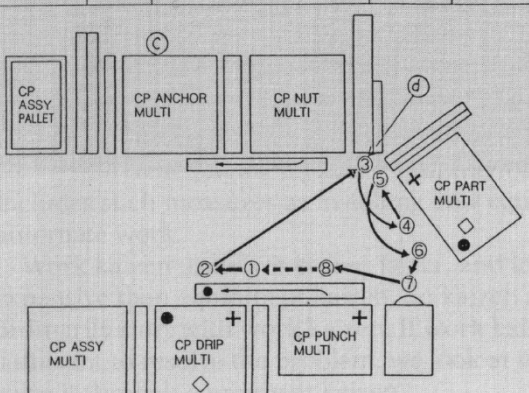
Standardized Work Chart

Process: Hold outer rail from Analysis No. 1/5 Section Date Fore-man Asst-Fore-man

Takt Time: 54"

Cycle-Time: 54"

Standard In-process Stock: 3



Type: 002G

Revision: —

Standard In-process Stock: 3

Quality check: (e)

Safety: (f)

Standardized Work Chart

Standard Work Combination Table

Date: '83.10.1 | Revised write per shift: 511 | Manual / Auto Walk

Process: From mate out rail To Set c/p in m/s | Section: JV | Takt-Time: 54

Step- seq	Operation	Time		Operation time (unit: sec)																	
		Max	Auto Walk	5'	10'	15'	20'	25'	30'	35'	40'	45'	50'	55'	60'	65'	70'	75'	80'	85'	90'
1	Hold outer rail.	2	1																		
2	Set outer rail and outer center pillar (CP) in dip multi-welder, and make 2 spot welds.	8	22	3																	
3	Hold outer CP and lower reinforcement.	5	1																		
4	Place outer CP in Part Multi-welder.	1	1																		
5	Hold small part.	3	1																		
6	Set small part in Part Multi-welder and start welder.	12	21	1																	
7	Perform additional spot welding (6 points) on outer CP.	10	2																		
8	Set outer CP in Punched Multi-welder, and start welder.	2	11	1																	
Totals																					

Standardized Work Combination Table

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Cell Run Rules – Start-up











- Process manager will be responsible for selecting the units to be processed daily. Process manager will use the Heijunka board to select units, place travelers on the totes, place totes in Passbox 1, and update Status Board.
- Cell assignments (technician, cell, time) and unit run schedules (cell, project, # of units, Lot #s, Priority) will be posted daily on Status Board.
- Technicians will set up cell (tools, equipment, and materials), perform SPC tasks, and review cell run rules.
- After cell set up is complete, technicians will process windows according to process rules on traveler, checking off cell process steps when finished until all buffers are loaded.

(A form of Standard Work)

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Standard Work for Triage RN

AREA		EMERGENCY			STANDARD WORK GUIDE			
STD #		471						
Job Title Description					Approved By		Revision	Date
Triage RN								
#	Action	Time (sec)			Process Description	Key points	Visual Aides	
		Work	Walk	Wait				
1					After Hx. And assessment, decide if patient will be discharged, unsure, or definitely admit. FRIS screen must be done.	When T & R, they may take appropriate charts in directly.	Step 1 	
2					Put a D for dischargeable, A for Admit and U for Unsure, in the space at the bottom of chart by the signature box.	When identified as dischargeable inform patient and initiate discharge planning. i.e. ride, CCAC	Step 2 <div style="border: 1px solid black; padding: 5px; display: inline-block;">A, U or D</div>	
3					Put a ll chart with a D in the treat and release slot. Put all A and U charts in the appropriate slot at PCRL desk. <u>ALL level 's</u> are to go to PCRL desk, if unable to go directly to bed.		Step 3 	
								
1. Critical		2. Safety			3. Look			

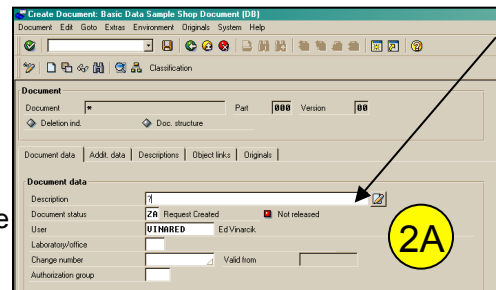
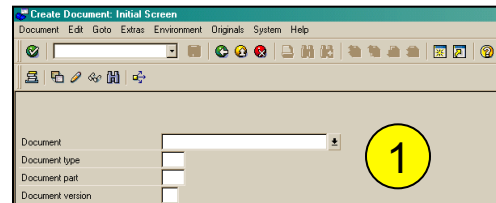
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Standard Work - Computers

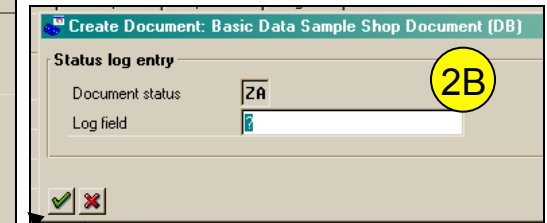


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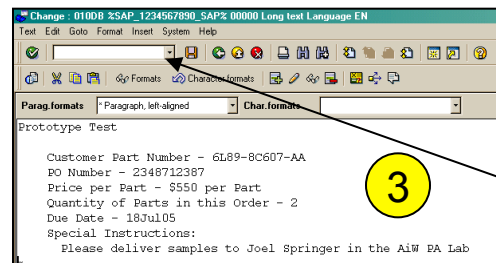
1. Open & log onto SAP
2. Enter transaction code CV01N
SCREEN 1
3. Complete screen as follows:
 - Leave document field blank
 - Document type is always DB for AiW prototype shop
 - Document part is always 000
 - Document version is always 00
 - Leave "Template" section blank
4. Hit "Enter"
- SCREEN 2A & 2B
5. On the "Document Data" tab:
 - Enter a summary description in the description field
 - Click on the "Long Text Box" next the "Description" field
 - In "Log Field" enter the quantity of parts needed & due date
 - Click the green check to proceed to the next screen
- SCREEN 3
6. Enter the following data in the text screen:
 - Customer part number
 - PO number
 - Price per part
 - Quantity of parts in this order
 - Due date (with month written out to avoid int. confusion)
 - Special instructions
7. Click on the disk icon to save the text screen & then hit F3
- SCREEN 4
8. Click on the "Addit. Data" tab & enter the following data:
 - Part number
 - Program name
 - Sample level (from pick down menu)
 - Sample customer (from pick down menu)
 - Mfg location (from pick down menu - 5880 Albion Plant)
 - Profit center (from pick down menu - 920981 - Prod-ECF)
 - MRD date (entered in MM/DD/YYYY)
9. Click on the disk icon to save



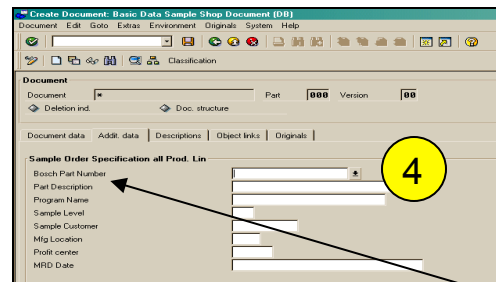
Long Text Box



Green Check



Disk Icon



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Addit. Data Tab

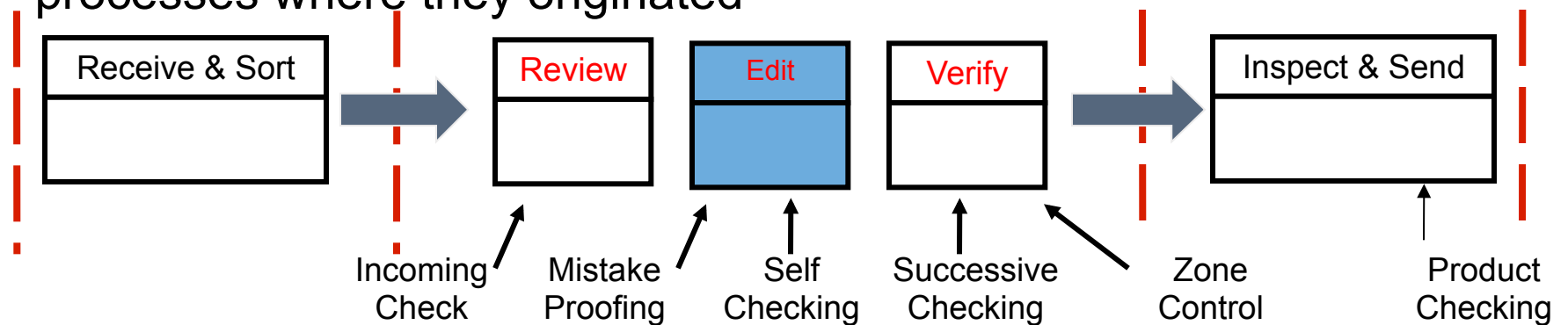
Quality at the Source

- The worker is responsible for making sure that the product or information he or she is passing to the next process step is complete and accurate.
- The worker is given the means to confirm a product meets customer requirements and the quality standards for a task or procedure as he or she passes it along.
- Samples, pictures, posted procedures, checklists and visual for comparisons and confirmation are tools that can be used for such purposes.

Prerequisite: Clear, agreed upon, and understood standards for the work.

Techniques for Catching Defects Close to Source

- Posted procedures & checklists (for both work steps and quality requirements)
- Self-checking (visual confirmations built into work sequence)
- Successive checking (following process checks)
- Mistake Proofing (automatic error detection)
- Zone Control (checks before leaving the group or area)
- Product Checks (final or functional inspection)
- Systems for immediately giving feedback about abnormalities to the processes where they originated



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Chunking Exercise, Part 2

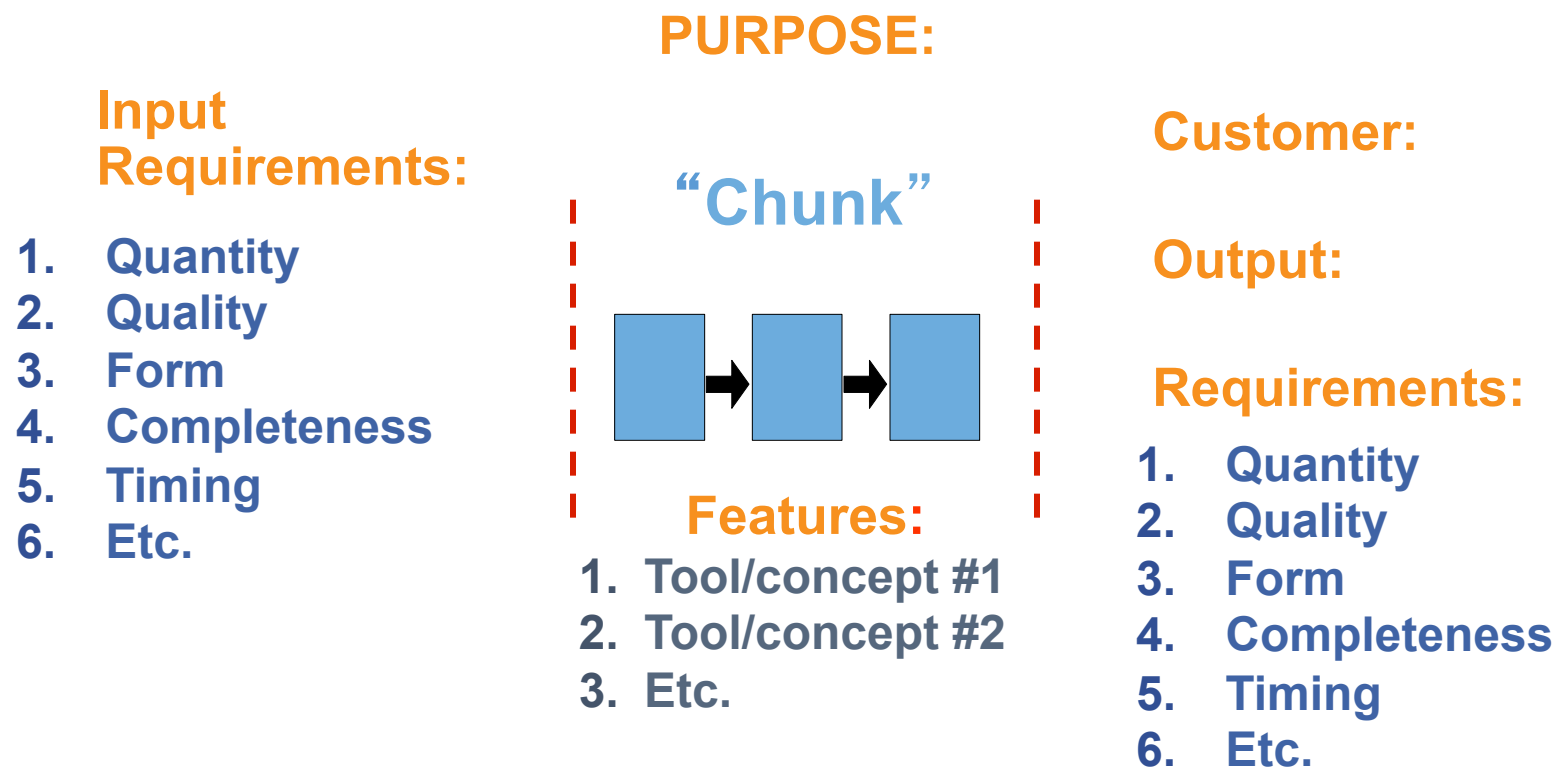


- Complete the Requirements Documents for each of your Chunks by adding the Critical Features the chunk needs to contain in the Future State
- Report Out (5 Minutes/team)

Complete the “Customer Requirements Document” for Your “Chunk”



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Incorporate key lean concepts and tools in the way the work will be performed in the future to better meet the customer requirements of the “chunk”

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Requirements Document— Jax Tax Example

Chunk: Prepare Return
PURPOSE: Enter required
info into tax software/print
completed forms

Inputs & Reqs:

1. C/A info re income,
expenses,
deductions, etc.
2. Desired filing date

Features:

1. Work order rule:
FIFO lanes by
desired filing date
2. Standard work for
data entry
3. Cross training

Customer:

Inspect & Mail

Output(s):

Hard copy of
completed tax forms

Requirements:

1. 100% CA
2. 1 day TAT

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Requirements Document— Manufacturing Example

Inputs & Reqs:

Molded comps
Purch comps
Sub Assem Comps
WI
Gages
Manufacturing Order
Operators
Equipment

PURPOSE: FINISHED GOODS

Features:

Level loaded
Balanced line ops
Space approp to
needs
Build based on FC
pull
Floor released comps

Customers:

Shipping
FG Warehouse
Molding
Sub Assem

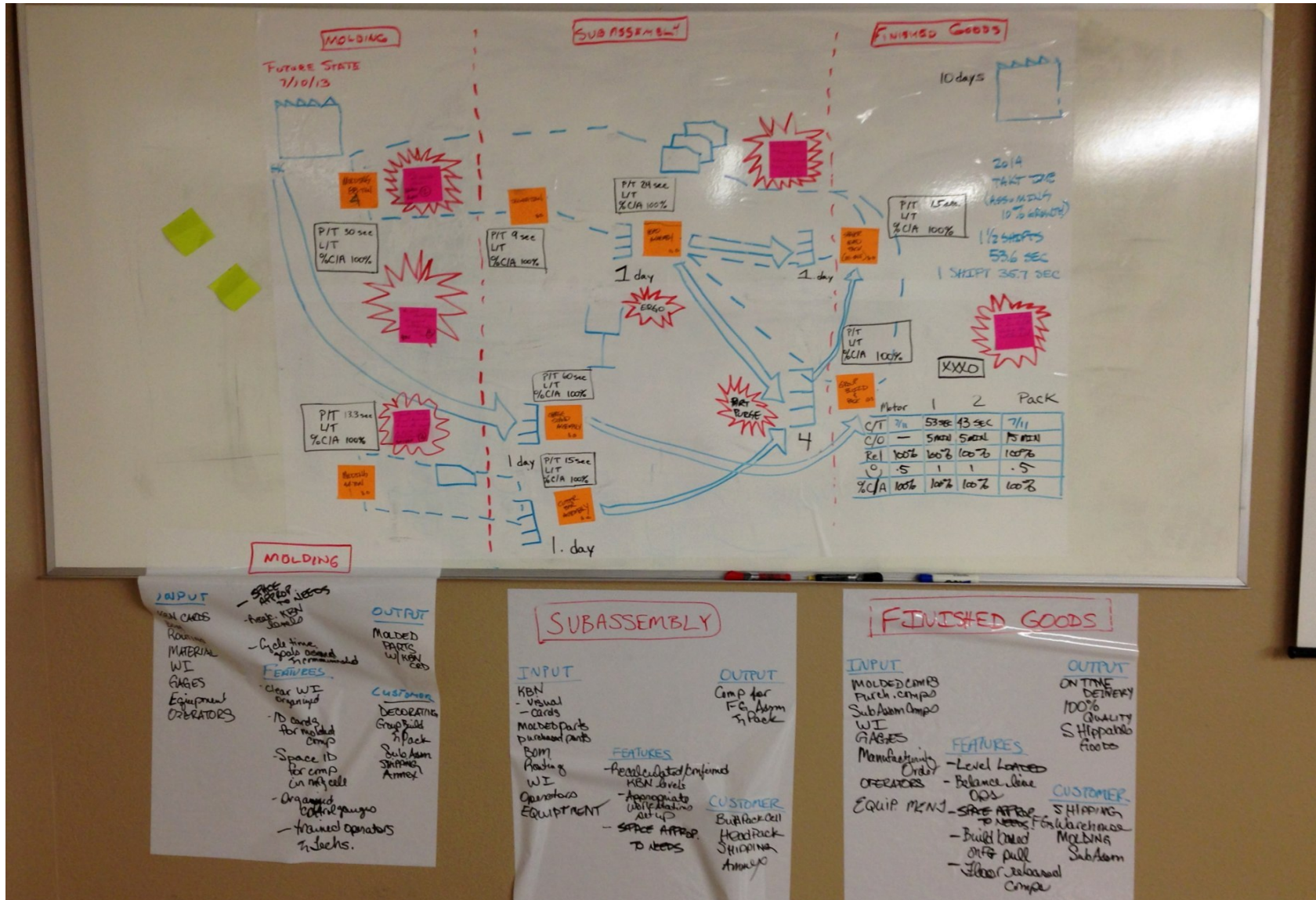
Outputs & Reqs:

On Time Delivery
100% Quality\WI
Shippable Goods

VSM w/ Requirement Documents



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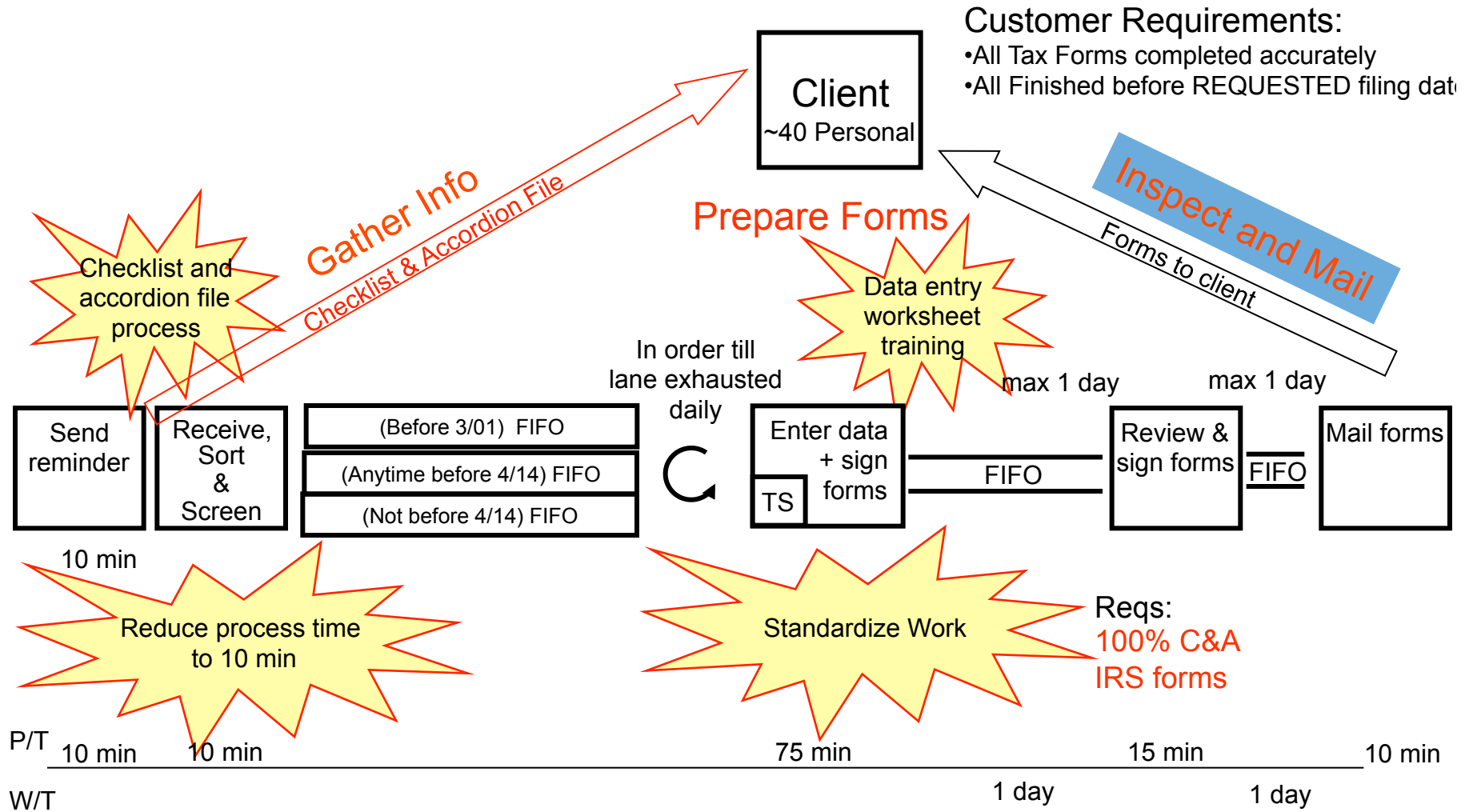


Creating a Future-State Map



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1. Define customer requirements
 - Define by “chunks”
 - Δ Determine scope of change
 - Radical vs. incremental
 2. Make the work flow
 - Optimize value creating steps
 - Apply appropriate lean tools/approaches
 3. Improve work quality and reliability
 - Control variation
 - Standardize
 - Make it visual
 4. Design to manage for improving and learning
 - Milestones
 - Regular checks and reflections
 - Feedback learning
 5. Estimate your results
 - Quality and process improvements (%C/A, P/Team/T)
 - Resources needed
- Define customers, needs, and deliverables
- Draw map from chunk features
- Define management system for continuous improvement
- Define how to measure performance to plan

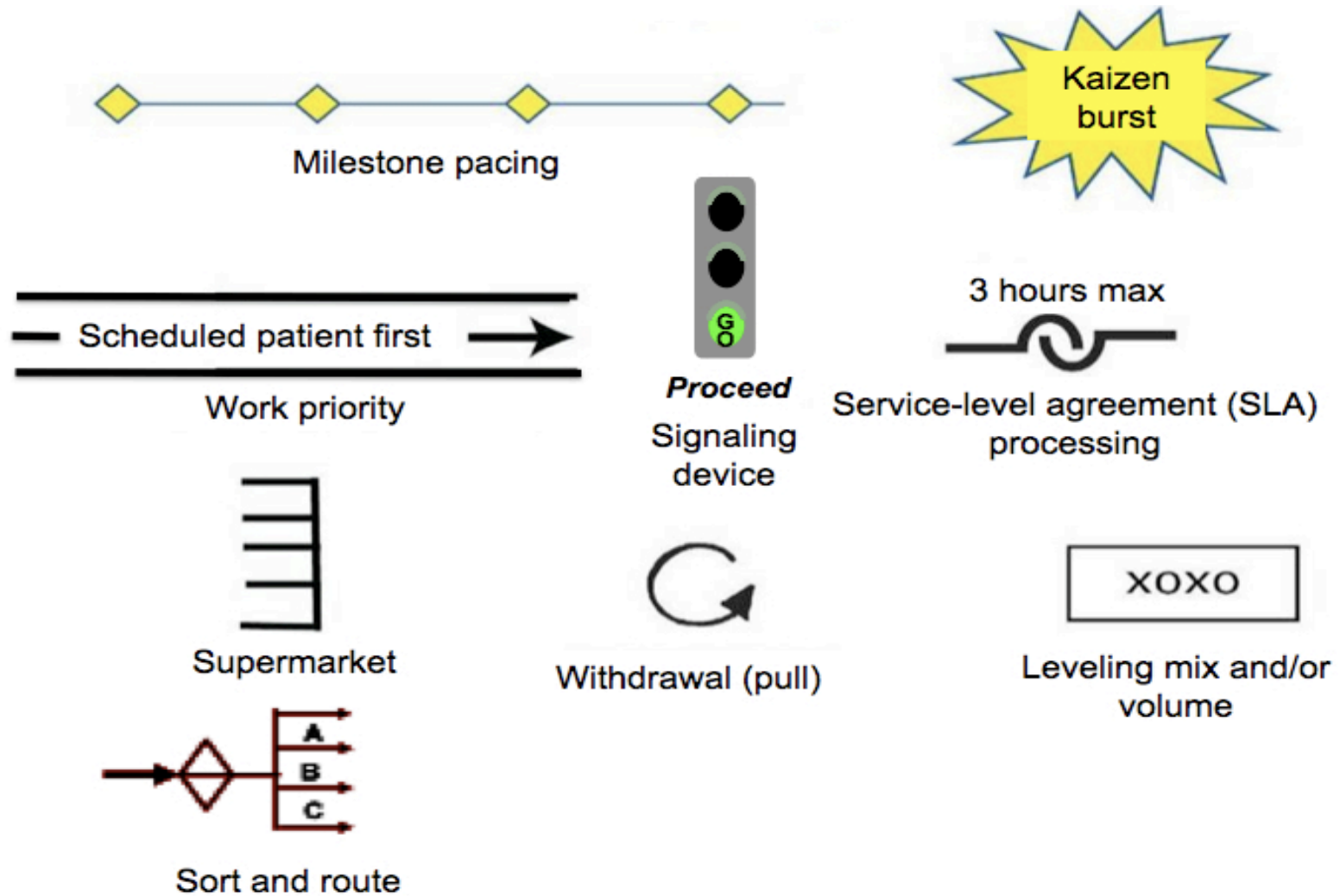


Future State Map
Jax Tax
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Future-State Mapping Icons



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Step 2, 3,& 5 – Future-State Map Exercise

Finish Steps 2, 3 & 5 of your Future-State Map
(We will discuss Step 4 later) (45 Min)

Confirm Which Problems Identified in Current-State map have been addressed in your Future-State map— Check them off

Report Out
(5 Minutes/team)



Action Planning

Achieving the Future State



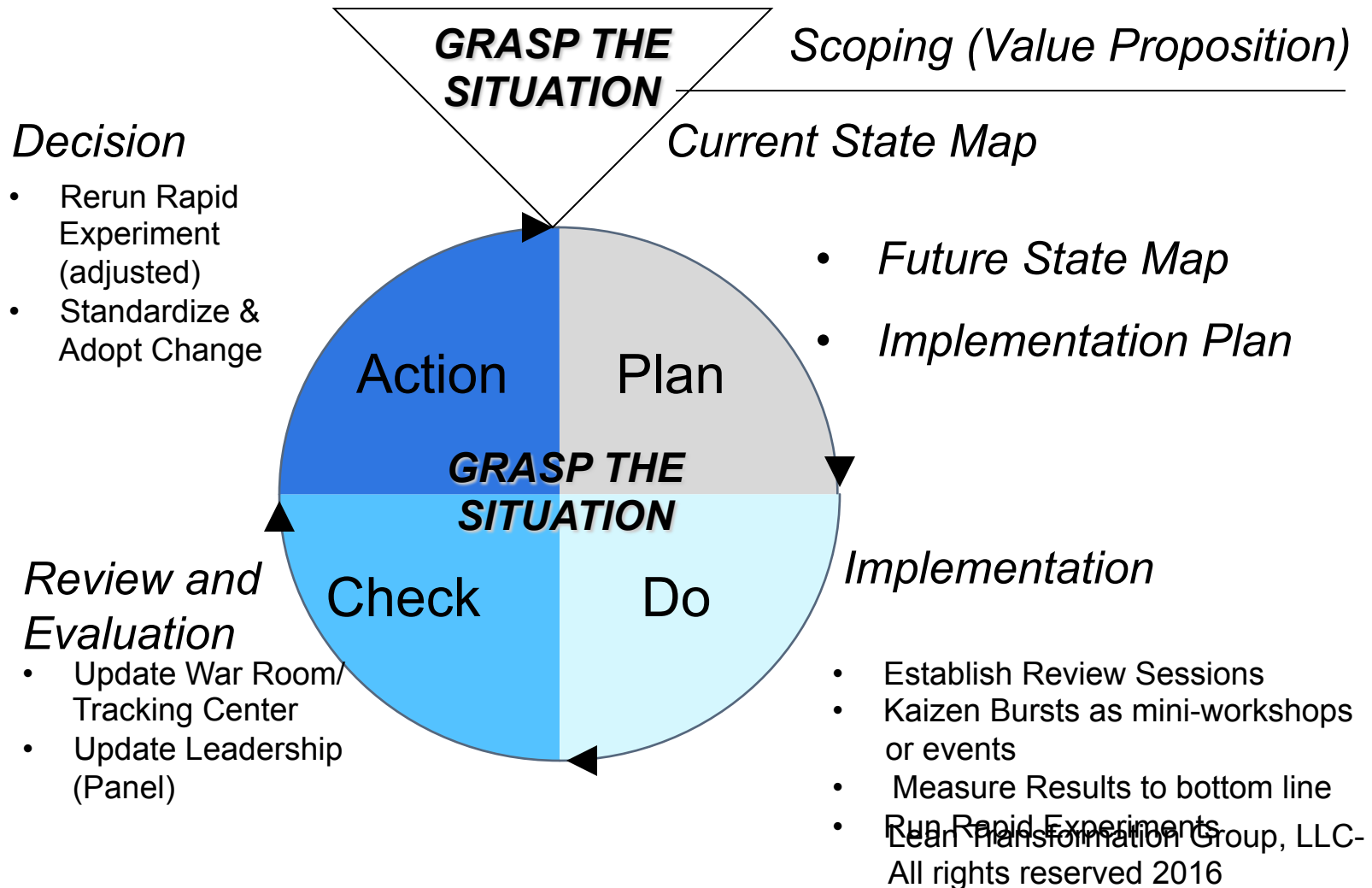
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1. Introduce the basics of implementation planning
2. Develop Value Stream Improvement Goals and Actions for your VSI project to move from the Current State to the Future State
3. Illustrate how the PDCA process is the driving force behind successful lean implementation
4. Show how Reviews and Checks initiate Countermeasures to achieve and sustain improvements
5. Summarize improvements and lessons learned

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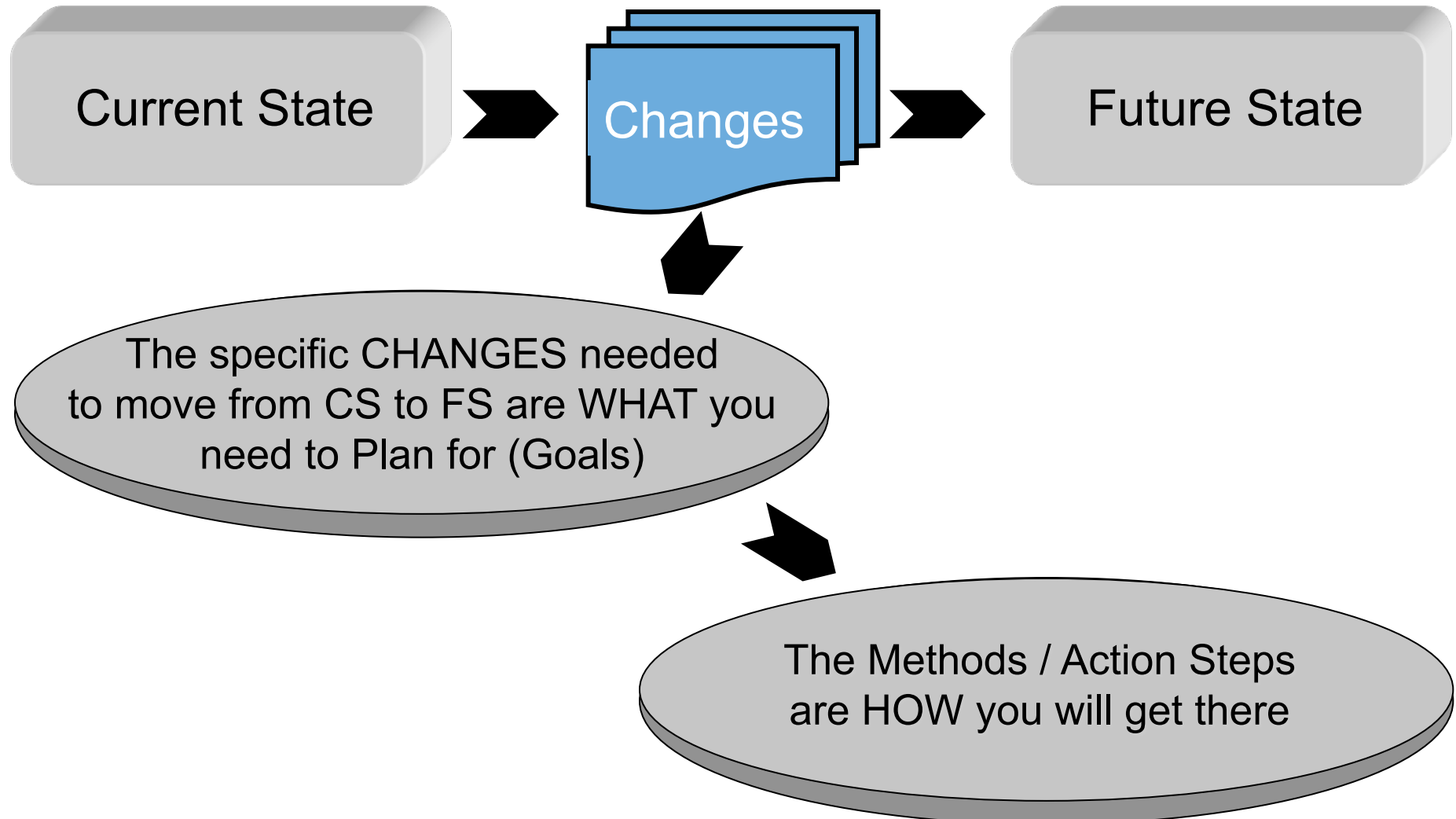
VSI Phases Using the PDCA Cycle for Managing Continuous Improvement

Pre-Scoping (Leadership Alignment)



Some Common Problems in Planning

- We plan in terms of actions (tasks) rather than goals or objectives
- Responsibilities and the specifics of deliverables are not clear
- We plan in silos, out of context of the rest of organization or operation
- We underestimate the time and effort required to implement
- We don't make reviews part of the plan



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What is a Plan?



**A set of agreements for making
a change or series of changes**

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What Do You Need Agreement on to Have a Plan?



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- **Implementation Goals**
- **Action Steps**
- **Responsible Persons**
- **Target(s)**
- **Timelines (Master Schedule & Action Plan)**
- **Support Roles**
- **Review Schedule**

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To Improve the Performance of a Value Stream

- Plan at the System level
- Implement at the Process-step level

Goals vs. Actions

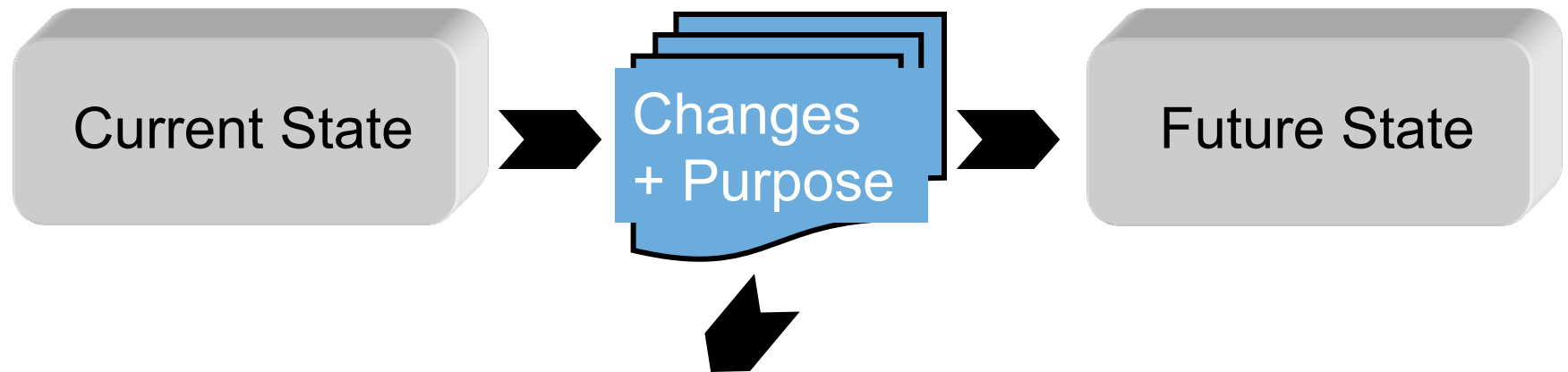
A **GOAL** is the change in the value stream plus purpose (outcome)

An **ACTION** is what you **DO** to get the outcome

You Need Commitment to the Outcome, Not Just to the Action!



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What is the Purpose of each Change (i.e., what impact will each change have on the performance of the Value Stream)?



GOAL = Change in VS + Purpose (Impact)

- 1. Implement checklist and accordion file system... ... in order to increase the %C/A of client supplied data.**
- 2. Decrease client types served by VS... ... in order to reduce variations in the work.**
- 3. Implement a 3-tiered sort and process flow... ... in order to file tax returns by client requested date.**
- 4. Establish work priority rules/ Slaps... ... in order to reduce W/T & improve on time delivery (OTD).**
- 5. Reduce the number of process steps performed by Jack... ... in order to free Jack to work on corporate returns (more \$).**

Clarify the Goals - Exercise

- **Select 1 to 2 changes you want to achieve in ~90 days**
- **Divide your work group, 1 for each change**
- **Write a goal statement for your group, including the:**
 - Change you want to achieve
 - Purpose for making the change
 - Targets for impact and timing
 - person “Responsible” for the goal
 - Support needed to achieve the goal

Planning Tool #1: Project Goals



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Goal (The change to be made):

Implement checklist and accordion file system in order to increase accuracy of submission of client supplied data

Targets (Measurable/Observable Impact & Timing):

- ✓ *90% or more C/A submission for Tax Year 2016*
- ✓ *System for requesting/checking client data 100% complete by 15 Dec 2015*

Responsible: *Jack*

Support: *Jack*

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Action Plan: Implement a checklist and accordion file system in order to increase accuracy of submission of client supplied data (+/= 90% C/A for 2014 tax year). System for requesting/checking client data 100% complete by 15 Dec 2015

	Action Step/Task	Responsible	Timing/Target	Support/Resources
1.	Design accordion files	Jack	6 Oct	Select 2014 tax packages
2.	Develop instructions/checklist for submitting data, using accordion files	Jack	13 Oct	Select 2014 tax packages
3.	Test instructions/checklist for accordion file preparation	Jack	20 Oct/ 95% C/A	Select 2014 tax packages, John, Jill
4.	Develop tools for screening accordion files for C/A	Jack	27 Oct	John
5.	Order printing for accordion files/checklists	John	3 Nov	Jack
6.	Purchase envelopes for mailing accordion files	John Jack	3 Nov 3 Nov	Jack John
7.	Develop client letter explaining checklist/accordion file and incentives for use	Jack	15 Dec	John
8.	Develop tools for tracking errors in checklist/accordion files submissions			

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Implementation Planning Exercise: Develop Action Plans for One Goal



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1. Brainstorm a list of tasks for your goal
2. Set target dates for each task:
 - Timing (start & completion)
 - Impact (how much, how many, how well)
3. Assign responsibility and support
4. Set review dates at key milestones

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Goal Development Template

Project:	
Change in value stream	Purpose

In practice, adding the phrase "in order to" helps convert a proposed change into a goal statement.

For example: Standardize discharge instructions *in order to* decrease the % of readmissions.
(change in the value stream) (purpose)

Business Objective: Increase corporate clients by 15%
 Project Objective: Reduce P/T for personal returns by 25%,
 Reduce L/T for personal returns to 2 days
 Project Goal # (2): Implement checklist & accordion file system...
 Project Sponsor: Jack Doe, CPA
 Project Date: 1 Oct 2006- 5 Jan 2007

Last Review Date: 25-Oct
 Review Frequency: Monthly, on Wed
 Next Project Review Date: 29-Nov
 Overall Status (%) Complete: 40%

Implementation Goal	Methods/Action Steps	Owner	Target	Timeline				Supporting Team Sign Off	Objective Status
				OCT	NOV	DEC	JAN		
2. Implement checklist and accordion file system to increase %C/A of client supplied data. Target: 90% CA for 2005 Tax Yr. Resp: Jack Support: John	1. Design accordion files	Jack	6 Oct	■	■	△			
	2. Develop instructions and checklist for submitting necessary information and documentation using accordion file	Jack	13 Oct	■	■	△			
	3. Test instructions, checklist for accordion file preparation for clarity and completeness	Jack	20 Oct			□			
	4. Order printing for accordion files, checklist	John	3 Nov			□			
	5. Purchase envelopes for mailing of accordion files to clients sand return to Jax Tax	John	3 Nov			□			
	6. Develop tools for screening checklist/ accordion files for C/A	Jack	27 Oct	■	△	□			
	7. Develop tools for tracking errors in checklist/accordion files submissions	Jack	15 Dec				□	□	
	8. Develop client letter explaining checklist and accordion file and incentives for use	Jack	11 Nov			□			

Reviews △ △ △

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Master Schedule & Action Plan for One Goal

Date: Project owner: Value-stream owner:			Overall value-stream goal:																Review frequency: Process: Area:										
			Timeline																										
Value-Stream Goal	Action	Action Target Date																								Action Owner	Objective Evaluation	Comments	

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Master Schedule Template

Project: Process owner: Value-stream owner: Project champion: Project date:			Objective: <div style="text-align: right; margin-right: 20px;"> Status <input type="checkbox"/> Status <input type="checkbox"/> Status <input type="checkbox"/> </div> Project Review Dates: 1) <input type="checkbox"/> 2) <input type="checkbox"/> Final) <input type="checkbox"/>													
Goals	Target	Responsible	Timeline										Support	Review		

Timeline Legend	
Timeline	
Review	Fill in when performed
Planned start/end <input type="checkbox"/>	Actual start/end <input type="checkbox"/>

Reviews

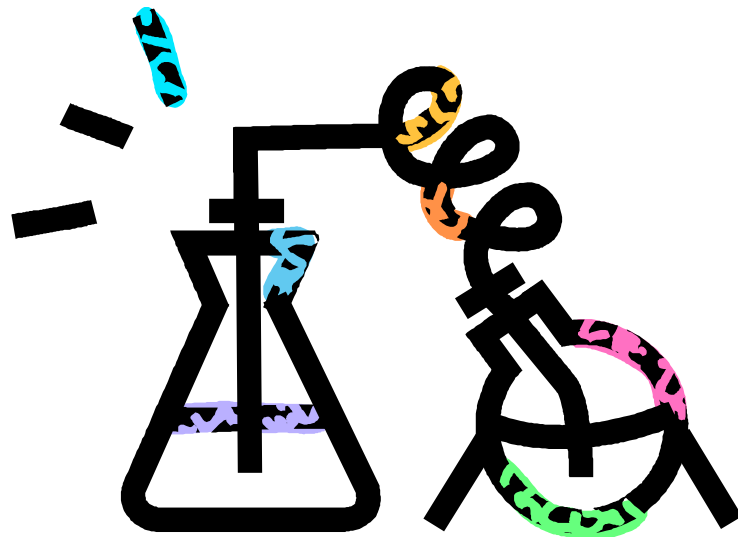
Signatures	Review 1	Review 2	Final Review
Project Lead			
Project Owner			
Project Sponsor			
Function Executive			

Evaluation Scale—for Management to the Plan			
	Implementation complete Impact confirmed		Implementation complete Impact unknown
	Implementation complete Impact insufficient		Implementation incomplete No impact

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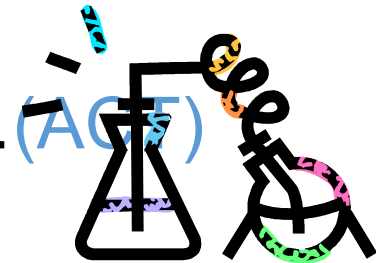


Fast Cycles of Learning through Rapid Learning Experiments (RLEs)

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Running an Experiment Means:

- Identifying the problem you want to solve
- Developing a THEORY about what you expect to happen... (GRASP THE SITUATION)
- Developing a way to TEST your theory... (PLAN)
- Running the test and OBSERVE the results...(DO)
- ANALYZ(ing) the results...(CHECK)
- CONFIRMing (or REJECT) your theory...(ACT)

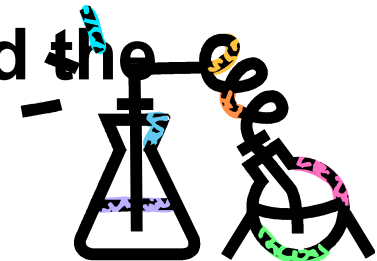


To Plan Your Own Experiment, Remember: WHO? WHAT? WHEN? WHERE? HOW?



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- **Who** is going to try out the change?
- **What** specifically are they going to do?
- **When** are they to do it? What day? What time of day? How many times?
- **Where** are they going to do it?
- **How** will you know that whether the change(s) worked (solved or improved the problem)?

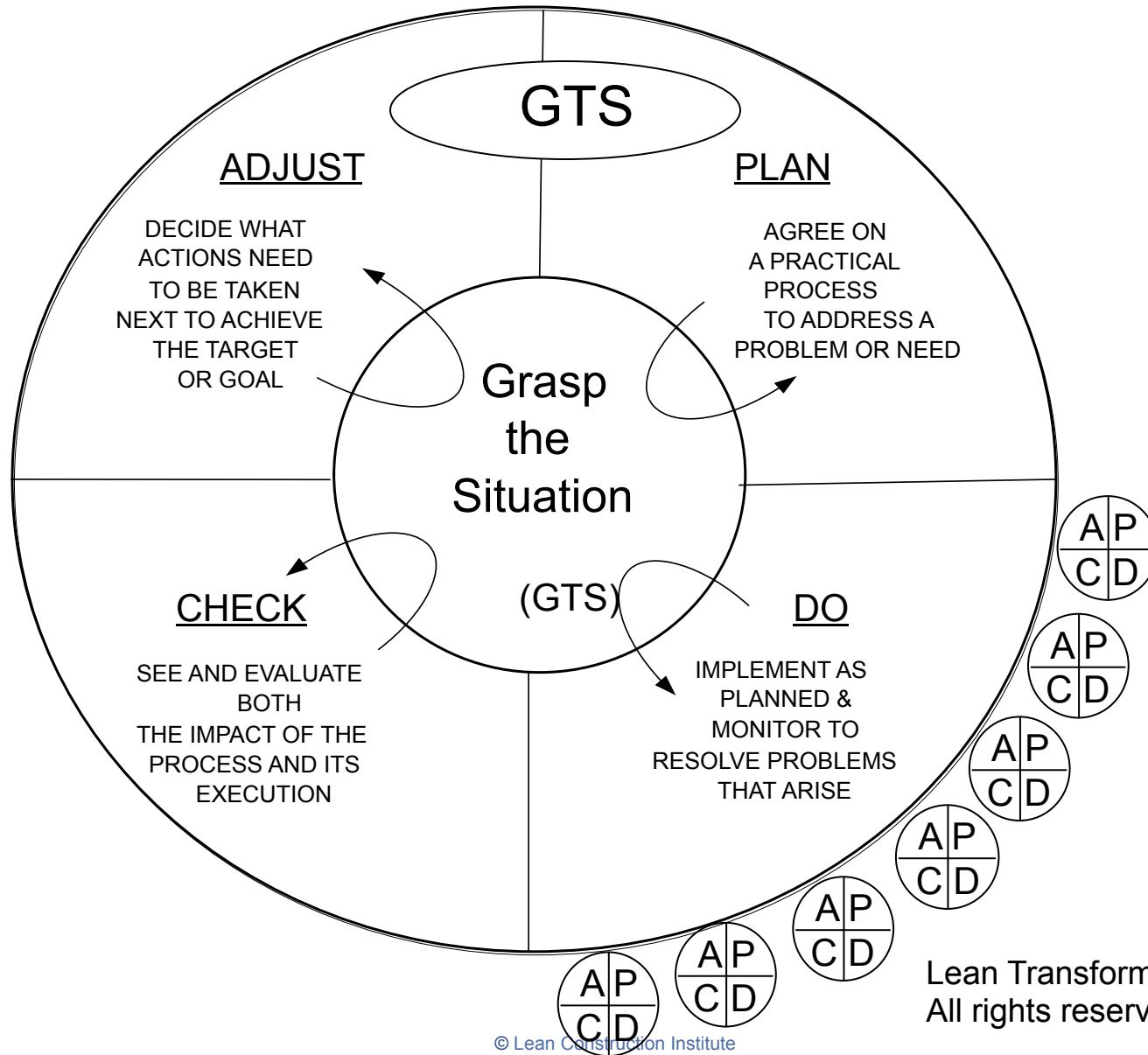


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Running the Experiment: Some Tips

- Before you run the experiment, do a dry run and adjust:
 - *the procedures for the experiment*
 - *the procedures for observing the experiment and collecting data*
- Develop an elevator speech and inform everyone who needs to know.
- Run the experiment.
- Interview the participants and get their feedback.
- Review participant feedback and observer data and decide what happens next:
 - *Repeat the original experiment in slightly different circumstances. Assess the results.*
 - *Modify the experiment and try again.*
 - *Scrap the experiment and try something different.*
 - *Implement the experiment as “standard work,” train others as needed, and monitor results (for consistency and impact).*
- Write a summary of your results and share with participants in the experiment and/or key stakeholders

Plan-Do-Check-Adjust Cycle of Problem Solving & Implementation

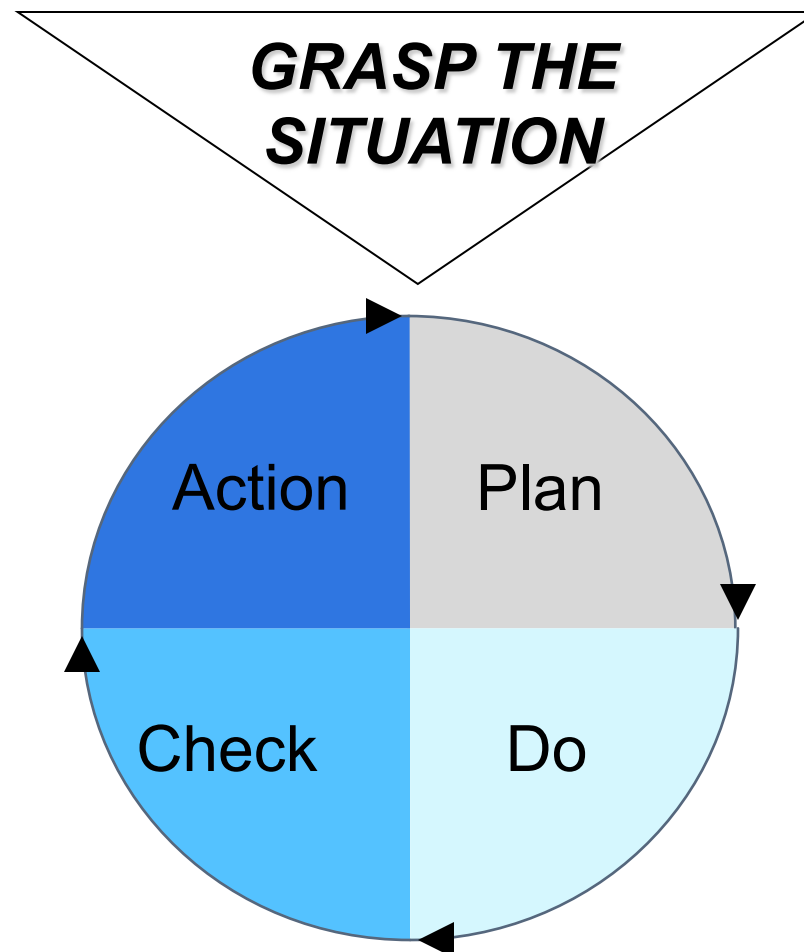


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Management Kata

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The PDCA Cycle for Managing Implementation



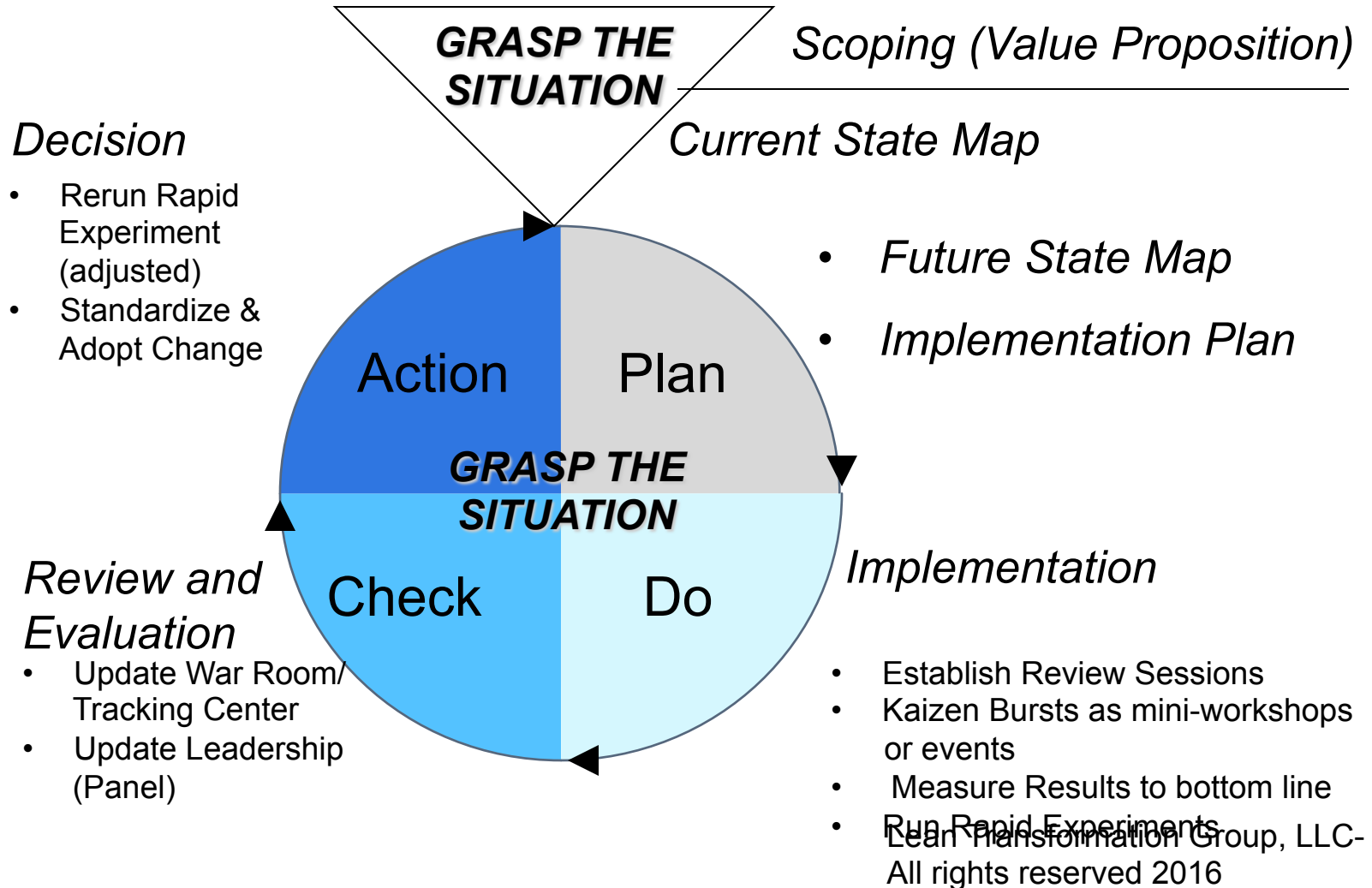
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VSI Phases Using the PDCA Cycle for Managing Continuous Improvement



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Pre-Scoping (Leadership Alignment)

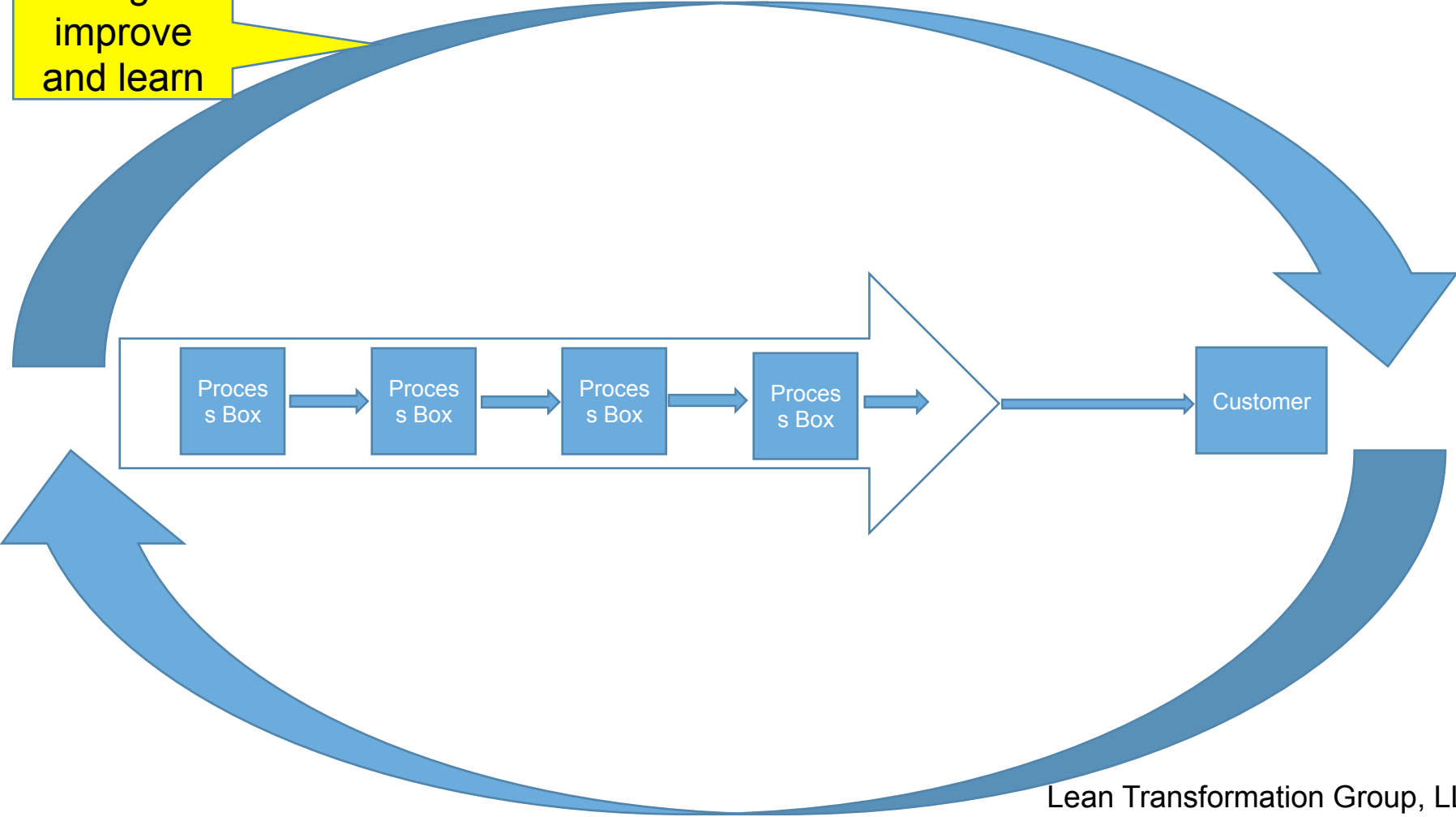


Step 4: Design to Manage for Improving and Learning



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(4&5)
Manage to
improve
and learn



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Step 4

Design to manage for improving & learning

Critical Questions

1. How will you use milestones to draw together the organization?
2. How will you manage the process so that the work is complete and accurate at the milestones?
3. How will you ensure that learning is captured and used to improve the performance of the value stream?

Key Lean Concepts/Tools

1. Identify performance indicators, create progress tracking tools, and use milestones to pace the work.
2. Conduct regular check-ups—use them to problem-solve on the spot.
3. Schedule formal reflection/review sessions at key points.
4. Capture lessons learned, feedback to members for continuous improvement.

Value

From the perspective of the customer

Flow

No waiting

No rework

Work

Standardized

Built-in quality

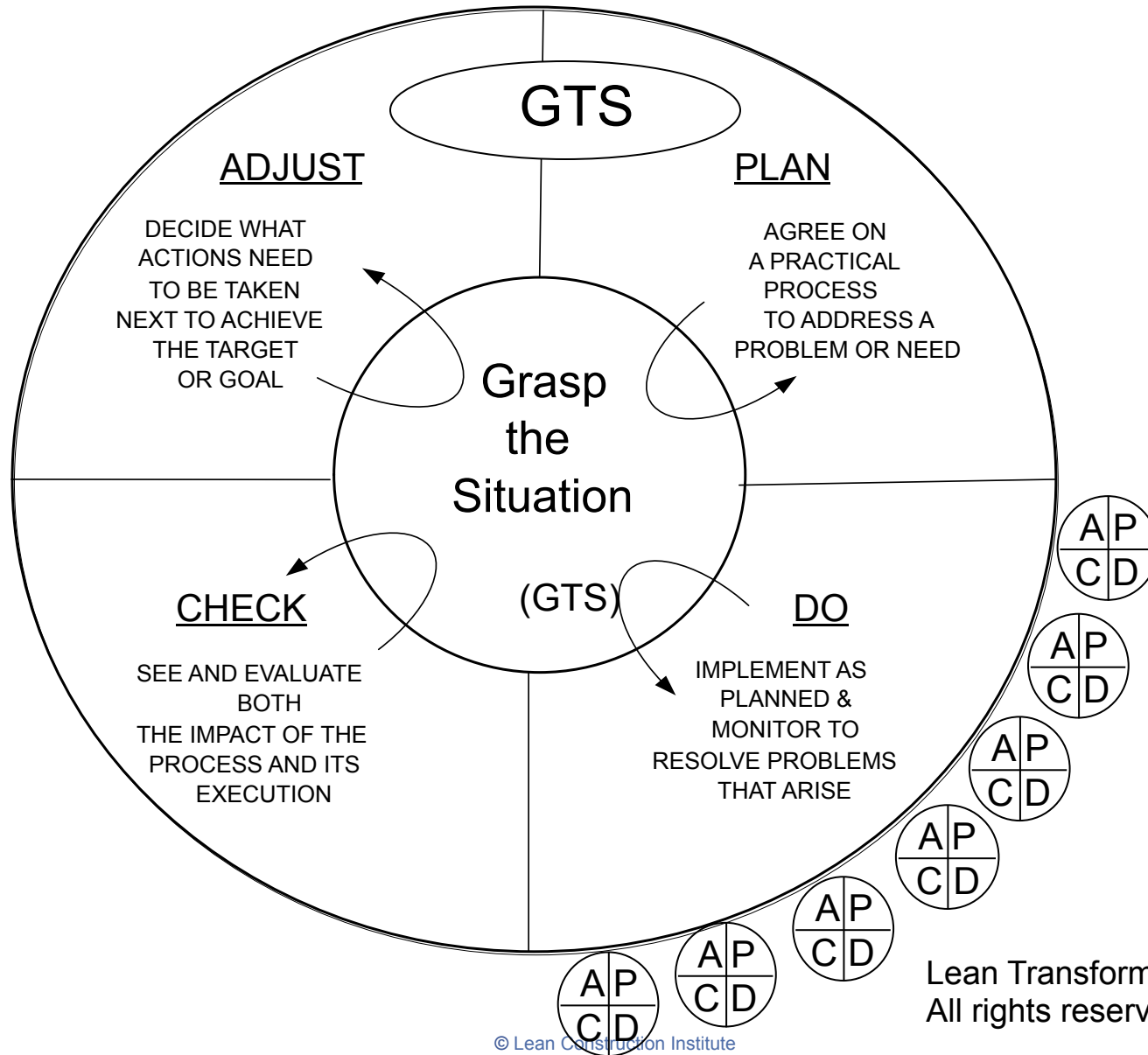
Managing for Improving & Learning

Milestones and Checkpoints

Learning embedded

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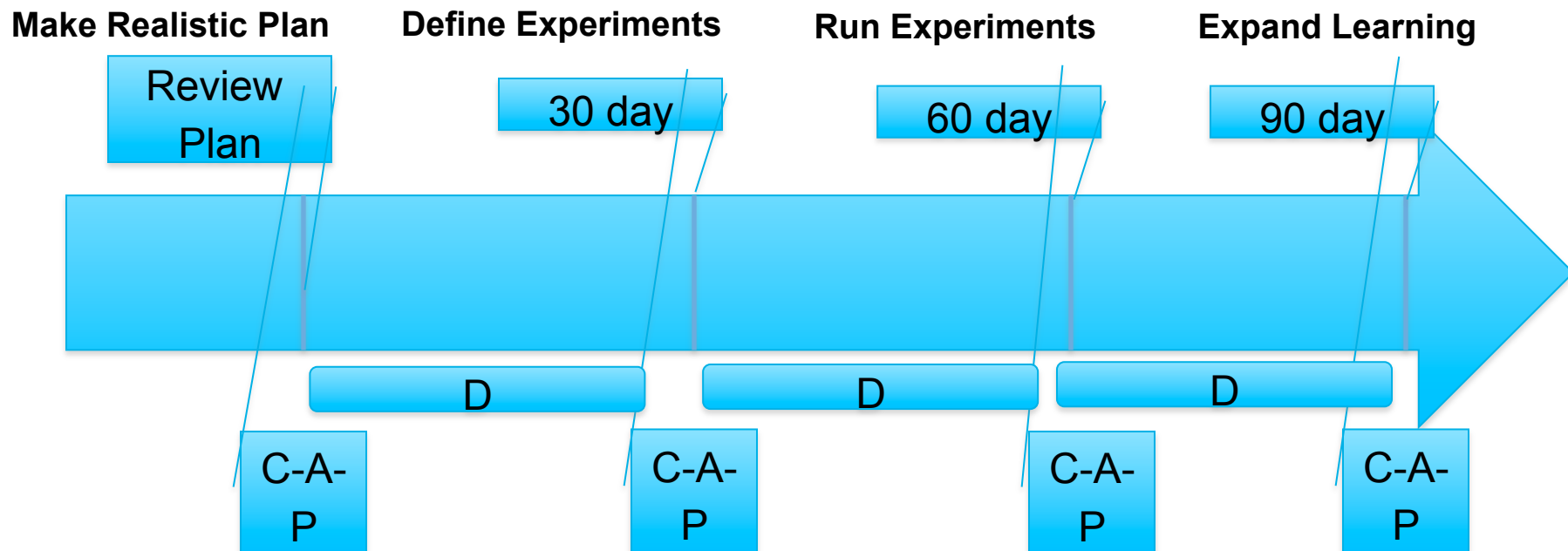
Plan-Do-Check-Adjust Cycle of Problem Solving & Implementation



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Learning Cycles for Implementation

(PDCA)



4 Keys to Effective Implementation 18TH LCI CONGRESS OCTOBER 3-7, 2016 • CHICAGO, IL

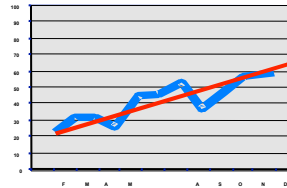
- Visible tracking – a Project Tracking Center
- Clearly defined structure and roles
- First-hand checking, reviews and reflection of plan to actual
- Problem/countermeasures follow-up

A Project Tracking Center

- A document board in highly visible area as close to the work area as possible
- Current and Future-State Maps
- Timelines
 - *Master Schedule for the Project*
 - *Action Plans for the Changes*
- Key Measures of Progress & Success
 - *Value Stream performance improvement indicators*
 - *Implementation progress & impact at process level*
- Other documents as required (only a few)
 - *Roles & Responsibilities*
 - *Review Schedules*
 - *Countermeasure Sheets*

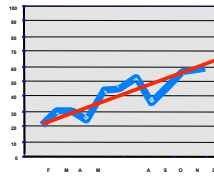
Levels of Tracking: Performance to Process to Plan

(Level 3)
Performance
Improvement
At System
Level

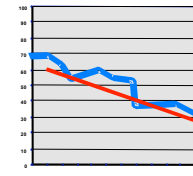


**Increase in on-time
completion of
monthly Close**

(Level 2)
Value Stream
Improvements
At Process
Level



**Increase in
on-time
submission
of sales
reports**



**Decrease in
Lead Time for
data entry &
checking**

Item	Task	Metric	Champion	Target Date	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
1																
2																
3																
4																
5																
6																
7																
8																

○ Started Task ▲ Proposed Completion ◆ Review Date
● Actual Start ▲ Actual Completion

**Completion of process
changes to increase on-time
reporting by Sales Depts &
automate data entry & review
by Marketing**

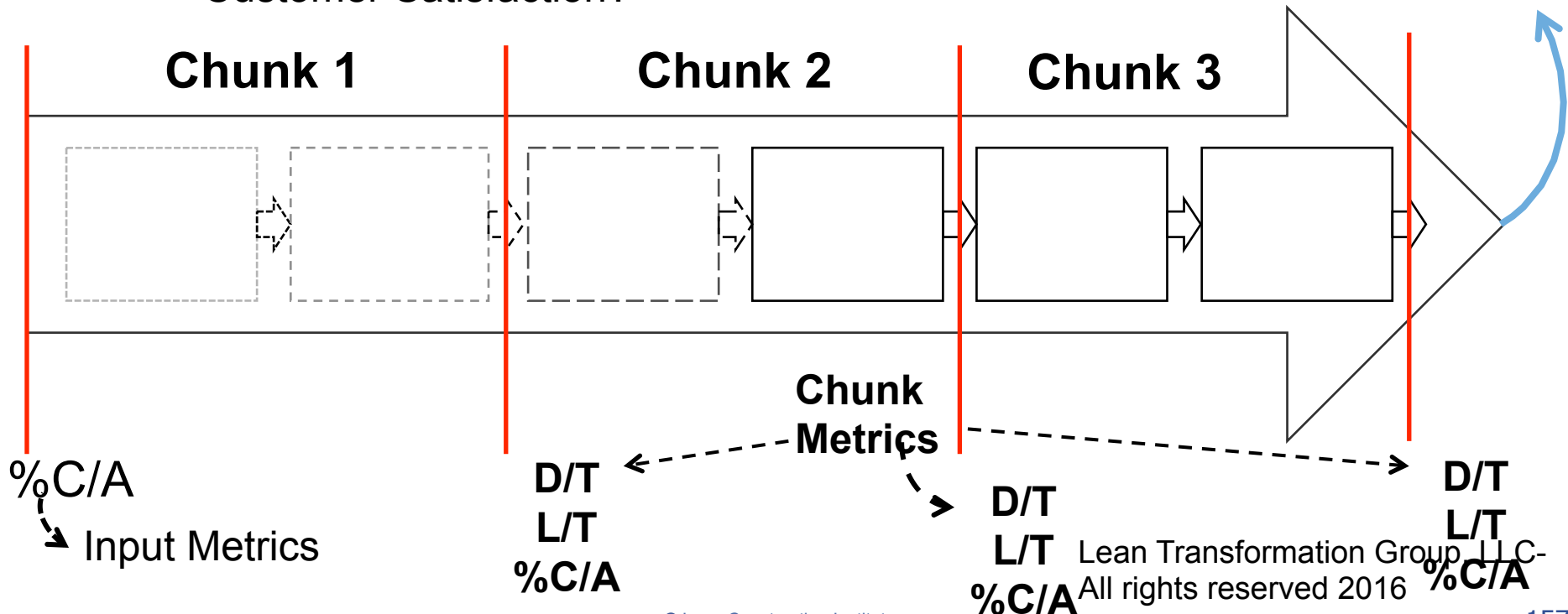
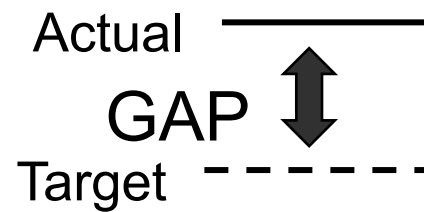
(Level 1)
Implementatio

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Measuring the Future State (Value Stream Target Condition)

KEY Value Stream Performance Indicator (s)

- Quality?
- Timing?
- Volume?
- Cost?
- Customer Satisfaction?



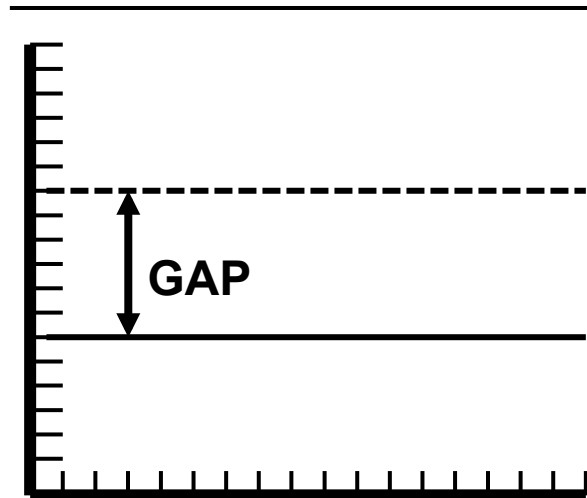
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Value Stream Performance Gap

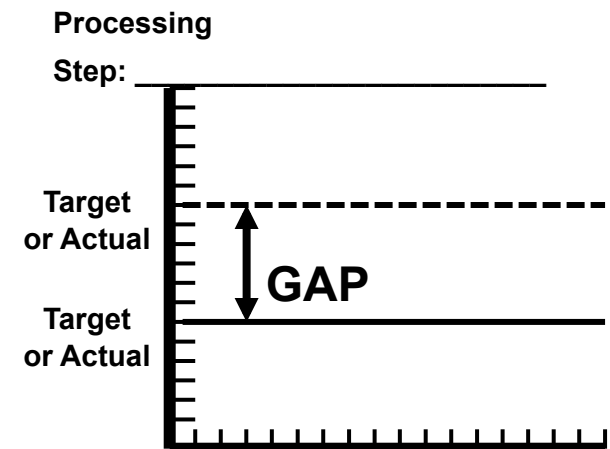
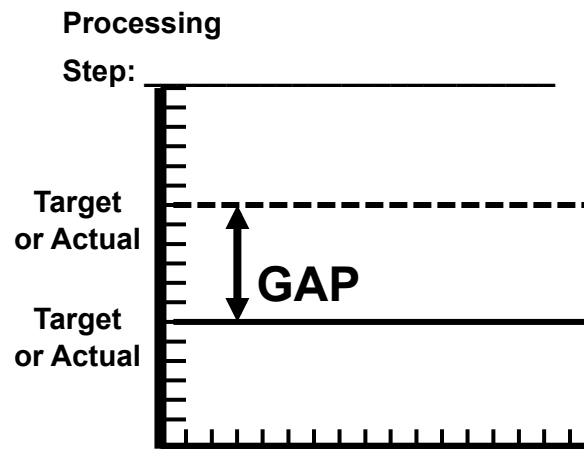
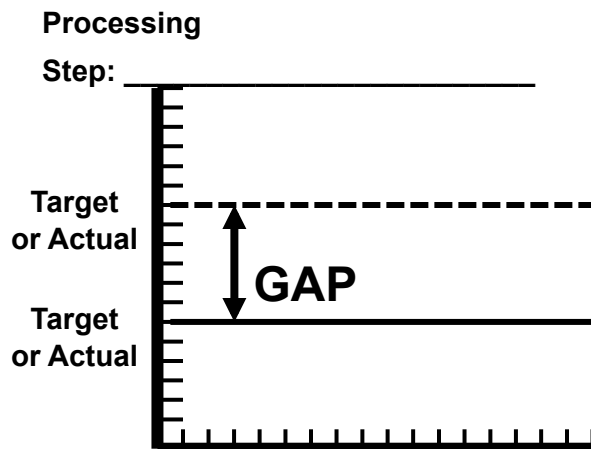
(linked to business or strategic priority)

Value Stream:

Target
or
Actual
Target
or
Actual



TOP 3 Problems in the Value Stream Contributing to Performance Gap



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Master Schedule

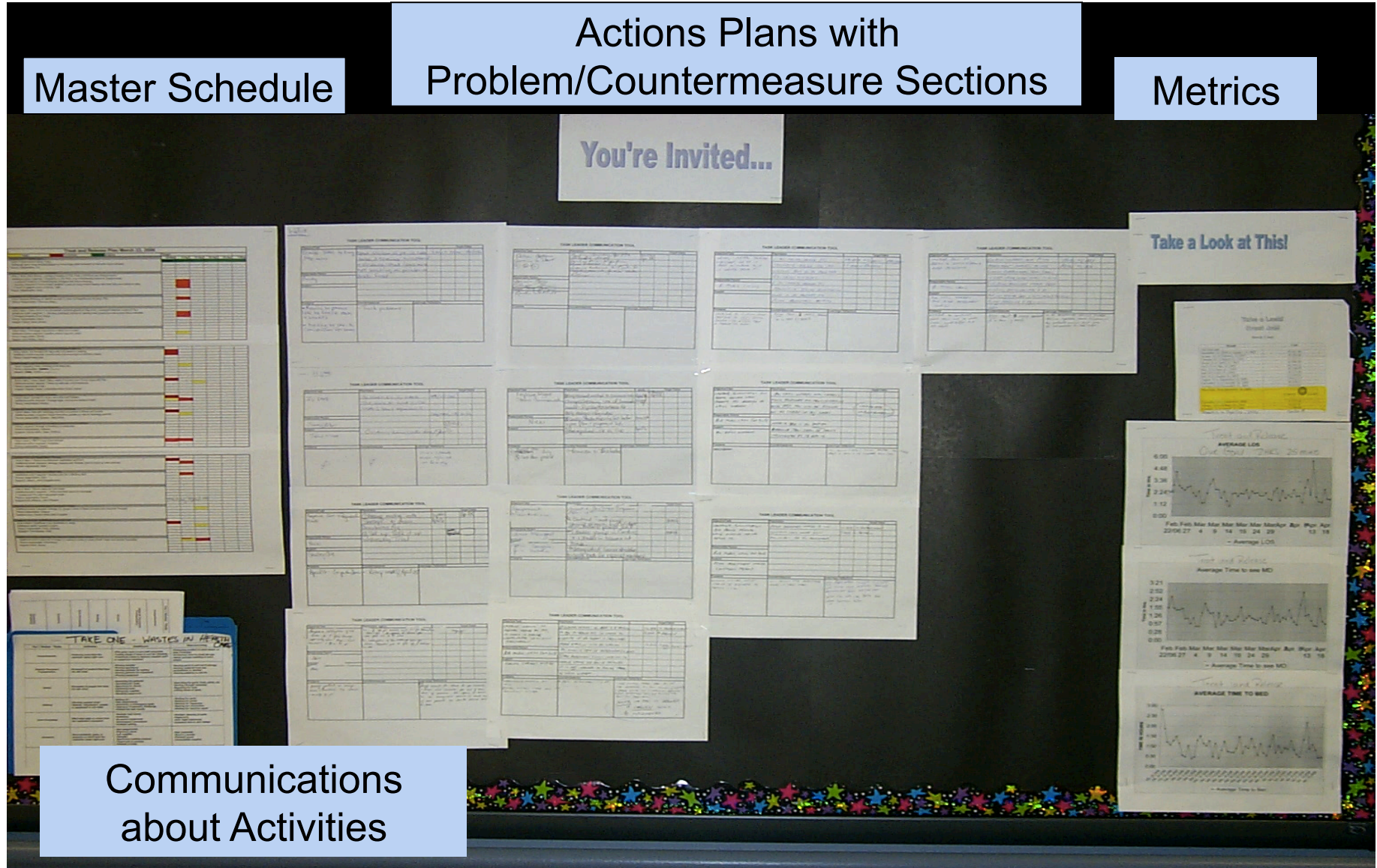
Actions Plans with
Problem/Countermeasure Sections

Metrics

You're Invited...

Take a Look at This!

Communications
about Activities



Typical Agenda for a Formal Review



Accomplishments

Performance To Plan

Analysis

What went well/not well?

What did we learn?

Countermeasures

What do we need to change?

Next 30 day Plan

Report to Leadership

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Group Exercise

– Management System

(30 minutes for the exercise)

- Design the management system to sustain improvements and learning...
- What are the Value Stream performance metrics?
- What are some process metrics for each loop/chunk?
- Determine the method and responsibility for Responding to abnormalities (design the visual management system)
 1. surfacing & responding to contain
 2. tracking & implementing root cause countermeasures

Remember: Use SIMPLE Visuals!

5 minutes per group for report out



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Reflection

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In Closing: One Final Exercise!



- Two-Day Reflection
 - Break into your teams
 - Use Post-it Notes: Write down 3-4 fundamental learnings/reflections you are taking away that you did not know before you arrived
 - Share the post-it notes with your team members.
 - Summarize the thoughts: we will get copies to you