Lean Process Improvement
Tools for Work and for Life

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Expectations

- Lean Introduction.
- Examples of Successes CDPHE.
- A3 Tool.
Change
What drives us to want to change?

- Environment.
- Stories that inspire us.
- Our own Experience.
The Genesis of Lean
Two Pillars of Lean

1. Continuous Improvement.

2. Respect for People.
The 5 Principles of Lean

1. Define Value.

2. Understand the Value Stream-process flow and information flow.


4. Pull Production.

5. Strive for Perfection.
Principle 1: Value
VALUE - the customer’s perspective

- easy access to information and processes.

- no wait times to get documents or approvals.

- good outcomes.

- being treated with courtesy, dignity, and respect.
What is Waste?

Waste:
Effort that adds time and cost, but no value.

Things to remember about waste:
• It is a symptom, not a root cause of a problem.

• It points us to problems within the system.
Eight Forms of Waste

- Waiting
- Overproduction
- Rework
- Motion
- Processing
- Inventory
- Intellect
- Transportation
A Shift in Mindset

- **Waste not defined**-leads to isolated, reactive improvements.

- **Waste visible**-leads to focused change and continuous improvement.
Principle 2: Value Stream
The Lean Value Stream

A series of business activities managed in a way that creates value that efficiently and consistently satisfies customer experience.
Value Stream

Value Stream Map the current situation:
- Focus on big picture.
- Common understanding.
- Links material flow and information flow.
- Aids in seeing sources of waste.
- Creates vision for improvement.
- Easily updated.
Principle 3: Continuous Flow
Continuous Flow

Uninterrupted flow without waiting or stopping.
Principle 4: Pull Production
Pull Production

SUPPLY
Producer
Dairy Farm

Provider
Grocery Store

DEMAND
Consumer
Uses Product
Principle 5:
Strive For Perfection
Strive For Perfection

- It is natural for people to make mistakes.

- Make it easier to do the process right than to do it wrong.
So what do you DO in Lean?

- Clearly defined problem statement.
- The right people.
- The right tools.
- Facilitated.
- Limited time.
What does a Lean Organization Look Like?

- Staff Empowerment.
- Data driven decision making.
- Culture of Continuous Quality Improvement.

“In Japan, you have ordinary people working in extraordinary processes. In the U.S., we have extraordinary people working in ordinary processes.”
How do we make the Lean culture change?
Organizational Structure

- Infrastructure.
- Prioritization of Initiatives.
- Capacity Development.
- Tracking/Data Collection.
- Communication.
How do we make the lean culture change?

- No downsize of staff.
- People don’t work faster or harder.
- Not reinventing the wheel.
How do we make the lean culture change?

- Focus on process.

- Address root causes.

- Support and Build on knowledge and great work that already exists.

- Frontline staff are respected.
Examples of Success at CDPHE

- Meetings - A small investment results in big returns.
- 5S - A Powerful Tool.
- Safety of Field Staff.
- HF application process.
Change Management

- The people side of change.
- >50% of the work.
Why is change difficult?
Why NOT Change?

- Flavor of the month, New pet project.
- We’ve always done things this way.
- We tried it before and it didn’t work.
- Don’t have time or resources.
Why NOT Change?

Change is optional—species die out over time because they don’t adapt to changing environment.
Stages of Change

Transtheoretical Model of Change and the stages of change.
Change Management

Change Management

What kind of leader do you want to be?
Questions?
But First...Project Selection
Generating Project Ideas

- Top Down & Bottom Up.
- Internal & External.
Potential Questions

- Which processes cause the most pain (e.g. take too long, have customer complaints, require too much time and resources?)
- What problems do our customers experience?
- What are customers complaining about or asking for?
- What would employees most like to change?
- What causes employees the greatest frustration?
- Where do we experience delays?
- What do other departments complain about?
- What problems would you solve if you were King/Queen for a day or had a magic wand?
Ease v. Impact

High Impact

Easy

Difficult

Low Impact
Ease v. Impact

Biggest bang for your buck
What is A3 Practical Problem Solving?

• A systematic, structured method for solving business problems.

• “A3” refers to the international paper size for tabloid-sized paper; roughly “11 x 17.”
What Else Can “A3” Mean?

In Lean, A3 can be used to refer to:

• The practical problem solving (PPS) process
• A reporting protocol for projects or strategy deployment
  • Including our Lean events and our 5S efforts
• A method for proposing policy changes
• Other uses

A host of uses which utilize the “single sheet of paper ought to be enough” mindset.
Why is A3 Valuable?

- Structured approach.
- Common communication.
- Promotes transparency.
- Forces people to “go see”.
- Defines ‘root cause’.
- Encourages team-based problem solving.
Beginning your A3 – what’s needed?

- A structure for problem solving
- A sponsor who wants the problem solved
- A team that:
  - Can solve the problem (has the skills)
  - Cares about solving the problem
  - Has the knowledge to solve the problem

Ensure you have the right commitment before launching the effort.
A3 Practical Problem Solving Flow

1. General Information

2. Problem Description, Background, and Target State

3. Problem Analysis and Root Cause Statement

4. Solution Evaluation

5. Implementation Plan and Results Confirmation

6. Follow-up, Lessons Learned and Stakeholder Buy-in
2a: Title and Problem Statement

**Title**
- Begin with an action verb
- Be as specific as possible
- Ensure the title is unique

**Problem Statement**
- Clearly state the key issue that needs to be solved

Key Questions:
1) Does the problem statement clearly identify the negative effect of the issue?
2) Could someone not from the area quickly understand why this is a problem?
A problem statement has the form:
- WHAT is not working?
- WHERE it happened?
- WHEN it occurred?
- TO WHAT EXTENT and
- I KNOW THAT BECAUSE...
Problem Statements

• An opportunity statement:
  • Does not include cause of the deficiency
  • Does not include likely actions or solutions
  • Is clear, concise and specific

“What is the problem we are trying to solve?”
Common Mistakes

- Most common - scope is too broad
  - Symptoms - Many outputs, vague goals, poorly defined problem, output cannot be measured.
  - Solution - divide problem into several projects.
Common Mistakes

- Other mistakes
  - Too easy. Problem is known. Solution-fix it!
  - Management issues.
  - Long term development project-capital intensive.
  - Product re-design.
2b: Current State, Brief Background, and Target State

Current State & Brief Background
- Visually depict how things work today
- Highlight the location of key issues
- State the background of the issue, as known

Key Questions:
1) Is the picture of the current condition and issues clear to the audience?
2) Is the problem quantified with baseline metrics?

Target State
- List the desired outcomes
- Clarify the expected change in key metrics

Key Questions:
1) What should be accomplished?
2) What will be improved and by how much?
3) When is the improvement expected?
Flow Diagram

- Map the Current State-not as it should be but how it really is
- How
  - Clearly label the process
  - Start with high level steps
  - Clearly identify boundaries and fill in the picture
- Also helpful to clarify what is NOT included

“If you can’t describe what you are doing as a process, you don’t know what you are doing.”

-W. Edwards Deming
3: Problem Analysis & Root Cause Statement

Cause and Effect Investigation
• Utilize simple problem analysis tools (e.g. 5 whys, fishbone diagram, cause and effect network, etc) to show cause and effect relationships

Key Questions:
1) Is the analysis comprehensive?
2) Does the analysis probe deeply enough to truly link/demonstrate cause and effect?
3) Have all relevant factors been considered?
4) Do those who will need to support the solution buy in to the reasoning?

Root Cause Statement
• Articulate the root cause of the problem

Key Questions:
1) Is this the only root cause?
2) Does the statement close the loop with the problem statement?
Root Cause

Agent, failure, or fault, from which a chain of effects or failures originates.

“Do Not Look Where You Fell, But Where You Slipped”
-African proverb
Fishbone Diagram

- Brainstorm contributing factors
- Use to categorize which causes are critical drivers of the effect.
- Category options
  - Policies, Place, People, Procedure.
- Helps identify which are easiest ‘low hanging fruit’ and what are outside of your locus of control.
Fishbone Diagram: Employee Turnover

- Economy: Availability of higher paying obs
- Performance of the Organization: If organization is struggling financially, workers may seek other employment for security
- Organizational Culture: Reward system, Strength of leadership, Org’s ability to foster employee sense of commitment, Org’s ability to foster employee sense of shared goals
- Employee Turnover

- Job Characteristics: Repetiveness, Challenge, Danger, Perceived Importance, Sense of Accomplishment, Status
- Unrealistic Employee Expectations: Job not clearly explained during interview process
- Personal Reasons: Family situation, Desire to learn new skill or trade, Unsolicited job offer
“5 Whys”

This technique, popularized by Ben Franklin, is based on the idea that asking “why” 5 times is needed to get to the TRUE root cause of the problem.

**Problem Statement:** Losing the war cost us the Kingdom

1st Why?
The war was lost because the battle was lost

Therefore

2nd Why?
The battle was lost because the rider carrying the intelligence was lost

Therefore

3rd Why?
The rider was lost because his horse threw a shoe

Therefore

4th Why?
The horse threw a shoe because it was not attached with enough nails

Therefore

5th Why?
The blacksmith did not have enough nails to attach each shoe properly

Therefore

**Root Cause**
A shortage of horseshoe nails cost us the kingdom

Adapted from Poor Richard’s Almanack
4: Solution Evaluation

Solution Options:
- Proposed solutions should address the root cause(s)
- Proposed solutions should be evaluated against success criteria
- Potential solutions should be tested via experiment as practicable

Key Questions:
1) Are the solutions within control of those on the team?
2) Do the solutions clearly link to the root cause of the problem?
3) Are the right resources available to implement the solution and make it stick?
4) How do the solutions compare in terms of return on investment (pay-back)?
5) Have the leaders and people in the work area initialed the form to signify their support of the potential solutions?

<table>
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<th>Solution Options:</th>
<th>Scope of Control</th>
<th>Resource</th>
<th>Relevance</th>
<th>Pay-Back</th>
<th>Buy-In</th>
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NOTE: You may have to conduct a loop from solution option to implementation via experiment to confirm results.
5: Implementation Plan & Results

### Implementation Plan

- Develop a high-level plan of the steps needed to implement the solution
- For complex problems, only note milestones
- Track status with standard R, Y, G notations

**Key Questions:**
1. Is clear ownership assigned?
2. Can implementation be phased to show the impact of each recommended solution?
3. Does the plan include communications?
4. Is the implementation schedule reasonable?

### Results (Confirmation)

- Display the results of the implemented changes

**Key Questions:**
1. Is the output graphical and compelling to those in the area and beyond?
2. Has the target state been achieved?
6: Follow-up, Lessons Learned, & Buy-in

**Follow-up & Lessons Learned**
- List what actions should be taken in light of learning
- Document the learning from the effort, both as it relates to the process and to the results

**Key Questions:**
1) What did you learn through this effort?
2) Have we learned what does/does not improve the situation?
3) What would you do differently next time?

**Signatures**
- List key stakeholders and document their agreement to testing solutions and to the implementation of the longer-term

**Key Questions:**
1) Is the stakeholder list encompassing of those impacted?
2) Has agreement to the test plan been achieved?
Title: Improve inventory accuracy in the Kitting area

Problem Statement:
Actual bin levels don’t always match Impresa reporting, resulting in partially-built kits.

Current State & Brief Background:
- Impresa System implemented in 2000, inventory accuracy has been an issue in the Kitting area since. Current inventory accuracy is running at 82%-60% of 336 bins tested had inaccurate quantities at last physical inventory. Kitters routinely complain of stock-outs on part numbers with system quantities > 0.

Target State:
Achieve 98% inventory accuracy in the Kitting area.

Cause & Effect Investigation:

Physical Inventory

**Root Cause Statement**
The kitting area is open causing the kittens to lose track of the manual updates.

**Follow-up & Lessons Learned:**
- Fencing in the kitting area contributed to improving inventory by ~11%
- Accuracy remains below the target level of 98%, so additional issues must remain
- Kitting delivery has not suffered as predicted
- Mechanics were not informed of the plan to enclose the area and are unhappy about not having access to piece parts

**Signatures**

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<th>Stakeholder Name</th>
<th>Role</th>
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<th>Final Signature</th>
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<td>Director (Sponsor)</td>
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<td>Team Lead</td>
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Summary

• A3 is one of the most important tools in applying Lean.
• Feel free to innovate.
• Ensure that you select a team from those who “Can, Care, and Know”.
• Cast a broad net for opinions during the process; avoid myopia.
• Go to the workplace to actually SEE the process—No conference room problem solvers!
• A3’s are dynamic—continually improve your solutions.

Go Forth Confidently...Learn by Doing!
Remember, mistakes are part of the journey to success!
Questions?
Stakeholder Mapping Tool

Impacted by Change

| High | Medium | Low |

| Enthusiasts | Followers | Opponents |

Reaction to Change

Influence over change and/or others

- High
- Medium
- Low