Optimizing YOUR Business Process from Concept to Collection

Tim Ward,
Manufacturing Consulting Services, Inc.

Getting Started

- Participant Introductions
- No such thing as a silly question in this class
  - “It is better to look silly once….”
  - Some silly questions lead to root causes….

Why I Do This

- What goes around comes around
- The negative side of this gets the most press
- However, the positive side works just a reliably
- Helping others comes back around in unexpected ways
- That’s why I do these workshops

Class Outline

- Getting Started
  - What is YOUR Process from Concept to Collection?
  - Why Bother – The Ignored 3rd Benefit of Owning a Business
  - Audiences: Why & When
- Foundation Principles
  - First 4 Principles
  - Continuous Process Improvement (CPI)
  - Theory of Constraints (TOC)
  - The Sluice Analogy
  - PDCA Problems & Perspectives
  - Strategic Continuous Process Improvement
  - Yeah Buts…
  - Lean Thinking Wastes & Remedies
  - Schools of Lean Implementation
  - Theory Wrap up
- First Project
  - Just Cause
  - Process Mapping
  - Process Metrics
  - JUST DO IT!

What is YOUR process from Concept to Collection?

American Production & Business M.O.

- In the past: check your brains at the door
- In the future: bring your brains to work

Strategy: Much better end results for the same work!

- Effects of identifying and eliminating sequential central throughput constraints:
  - Pressure Washer (Revenue x 2) x 6x/Rev = 12 x Profit
  - Student Projects (You CAN do this!)
    - Chinese restaurant: Profit ↑ 25%, wait time ↓ 50%
    - Scrapbook publisher: Profit ↑ 37%, delivered new product at trade show vs. 1.5 months later… first time ever.
    - Commercial real estate loan brokerage: 60 → 34 days
    - Law firm print department: 13 → 3 complaints per week
    - Emergency food storage fulfillment: 3 → 1 ½ weeks
    - And more….

Valuation Effects of Strategy: Long-Term Time Value of Money

- Is $1,000 today worth more or less that $1,000 in 3 years or 10 years? Why? How do you quantify the difference?
- The Long-term Annual Borrowing Interest rate (i)
- What is the Valuation Impact (Net Present Value - NPV) of making a permanent change that either saves you money or makes you money… Say, $1,000 per month at a long-term annual borrowing interest rate of 10%?
- NPV = [($Amount/mo.)x12]/I = ($1,000x12)/(.10)
- NPV = $120,000: This is how you change firm's value!

Why bother? (Ignored 3rd benefit of business ownership)

Annual Financials	Yr 0	Yr 1	Yr 2
Net Sales (i.e. Thousands)	1000	1000	2000
Labor	400	400	770
Materials	400	360	650
Supplies	50	40	80
COGS	850	800	1500
Gross Profit	150	200	500
Fixed Costs	100	100	150
GM **Salary**	50	50	50
Net Profit (& Buffer)	0	50	300
Valuation (5x…usually ignored)	0	250	
Valuation (8x…↘ Risk… also ignored)			**2400**

Towards That End…

- The project I am going to teach you today is the same one I taught to my university students

We Are Here to Triple to Decuple Your Company ***Value*** in 3 years (very conservatively). Some are much more….

- Your company ITSELF is an asset.
- We are trying to ***INCREASE YOUR COMPANY VALUE*** between 200% and 1000%+ inside of 3 years.

Why might these people be interested?

- Business Seller
- Business Buyer
- Investment Advisor
- Business Owner
- Troubled Business Owner

- Before Sale
- Before Purchase
- Before Transaction
- Now
- Before Now!

Very Simple Tools in This Class

- Wood Screw

Foundation Principles

First 4 Principles

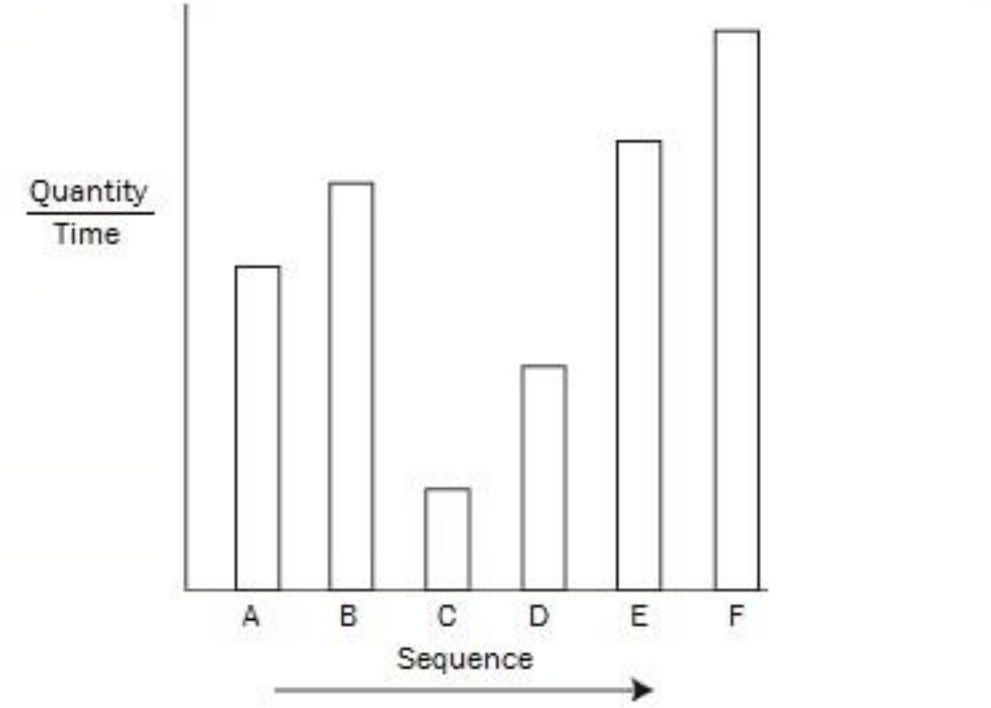
1. Why?
2. Steady Growth vs. Instant Perfection
3. Mistake U "Why" ➔ Development
   - You were trying something different!
   - 2-1=1: Two steps forward and one step back is Great! Do it in "Tornado-like fashion"
   - No steps forward is strategic suicide
   - Focus on fixing problems, in priority order…not on fixing blame
4. The "System" is never done

Continuous Process Improvement - CPI

- 3 Major Toolboxes
- These were developed independently, primarily to compete with each other
- Theory of Constraints – Increase Throughput
- Lean Thinking – Decrease Waste
- Six Sigma – Decrease Variation
- In the mid 1990's, practitioners began "Looking over the wall": the 3 toolboxes are Highly Complementary!

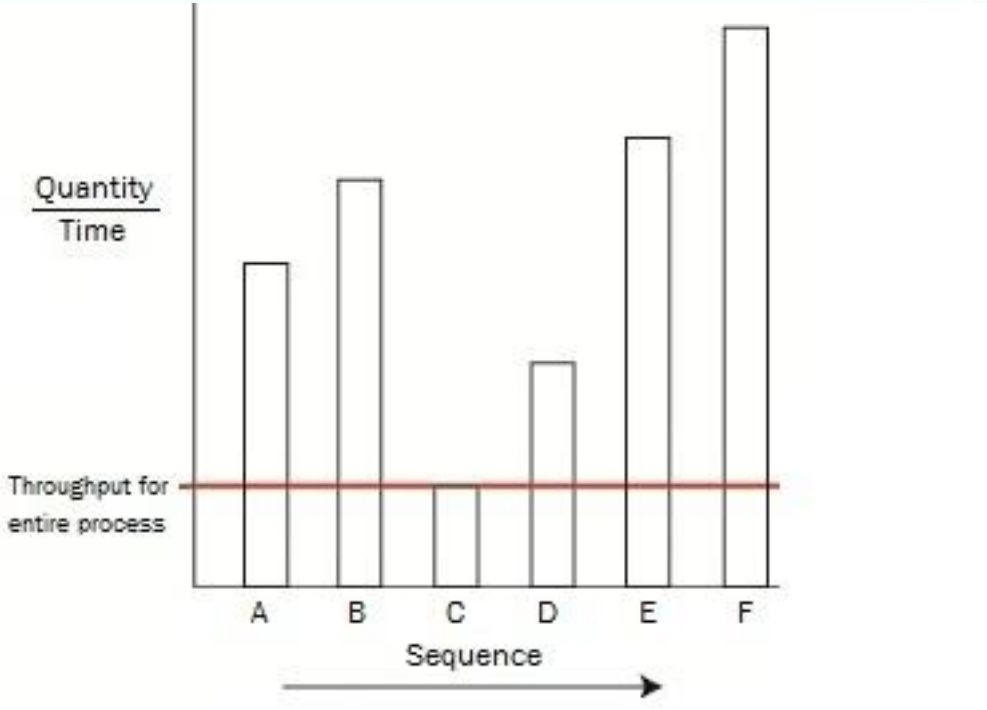
Theory of Constraints

Typical First-In-First-Out (FIFO) Process



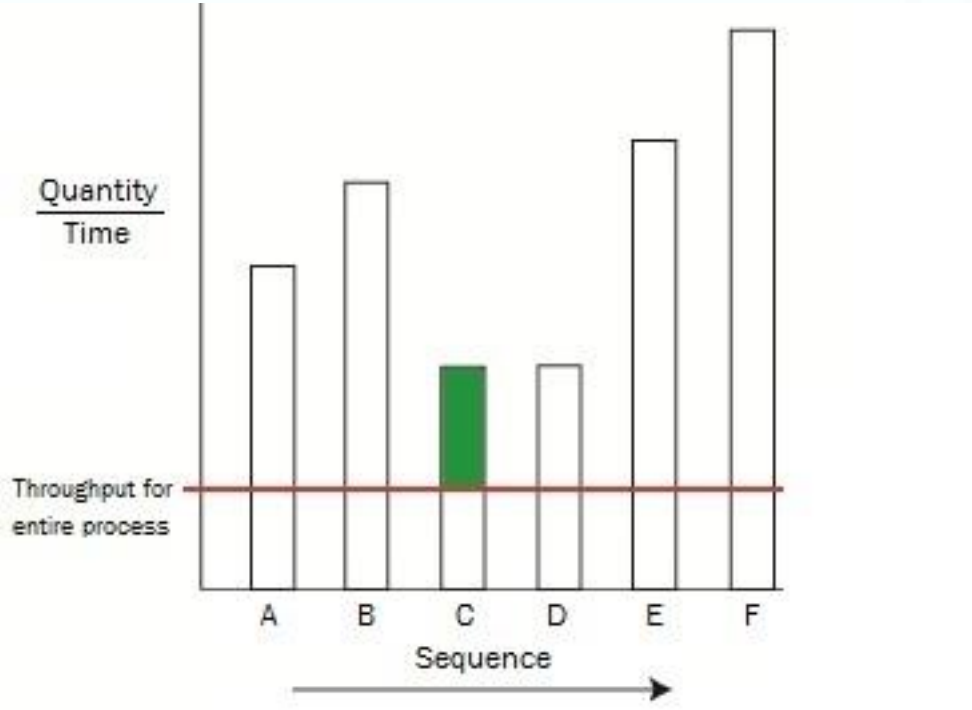
What is the throughput of this system?

Throughput for Entire Process



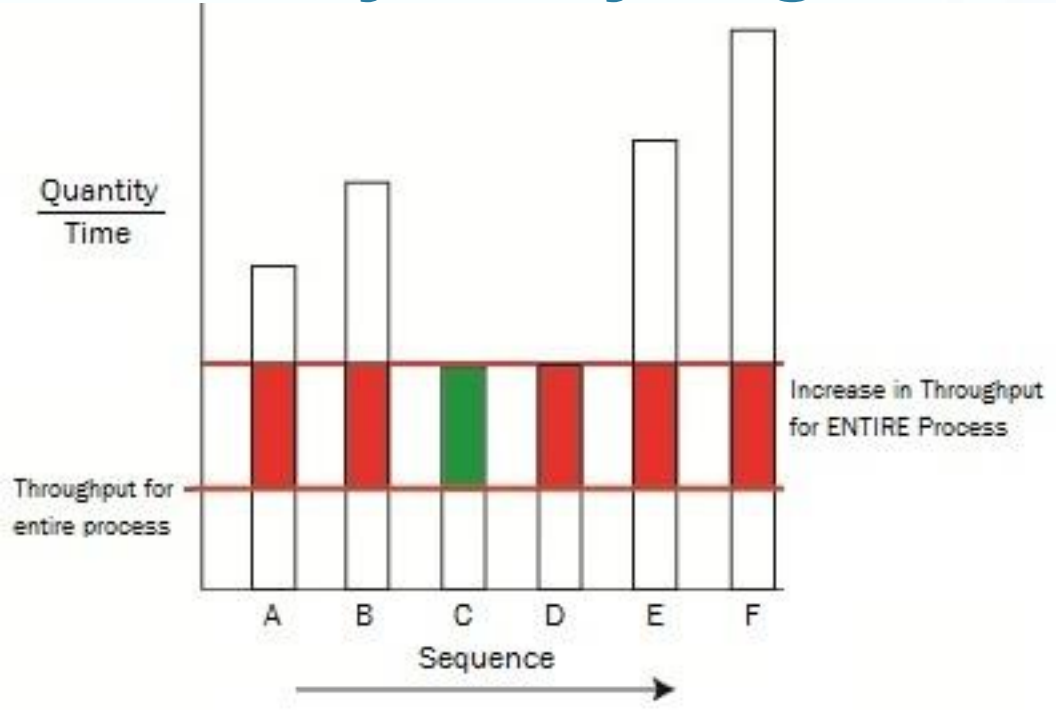
Where's the biggest waste?

The Biggest Waste



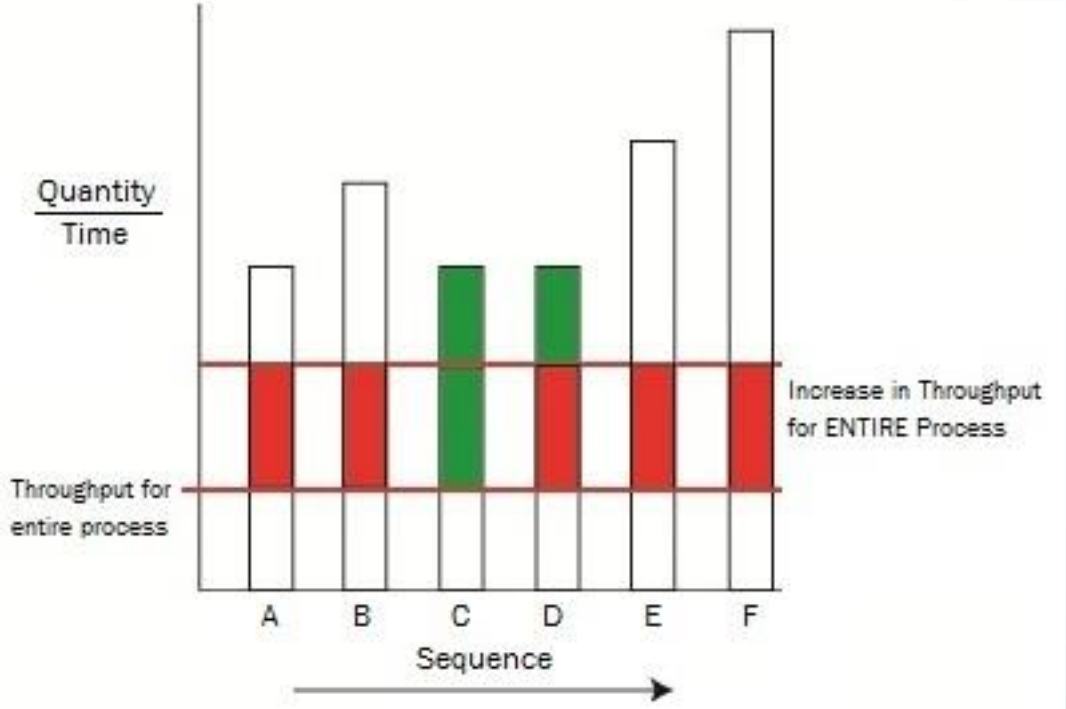
Why is this the biggest waste?

Accessing Capacity You're Already Paying For



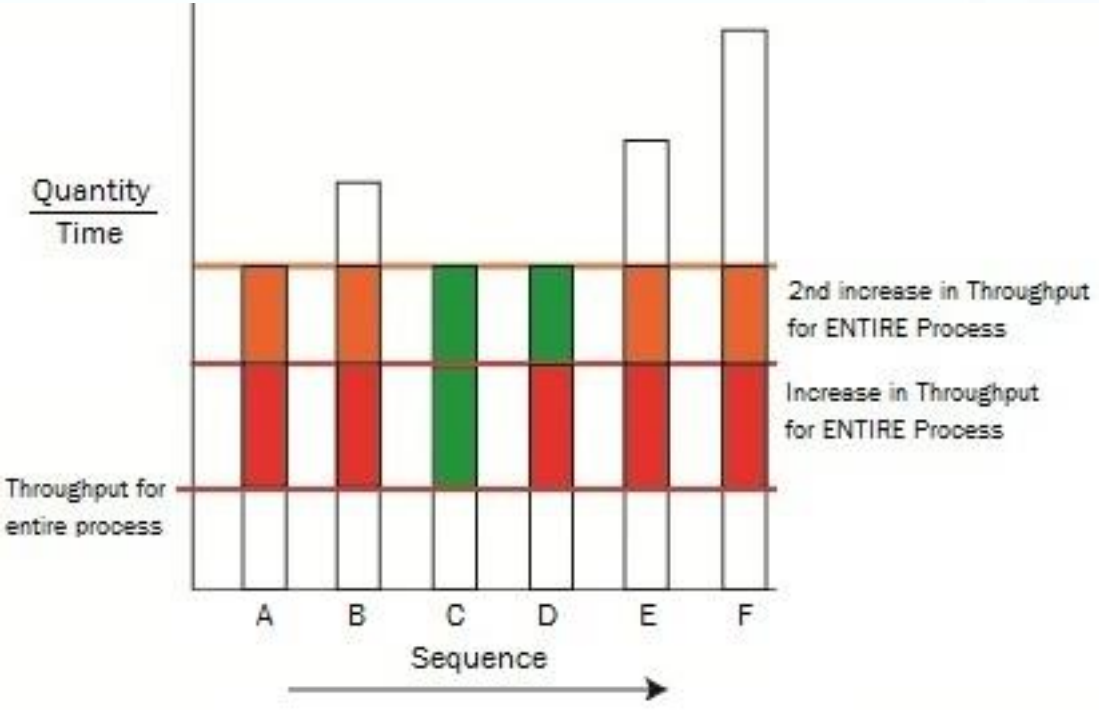
What is the next biggest waste?

The NEXT Biggest Waste



Why is this the next one?

TOC: Summary



- The Lean Wastes are “Smoke”…
- The biggest opportunity is when you get to fix the ***sequential*** throughput problems

Defining Throughput

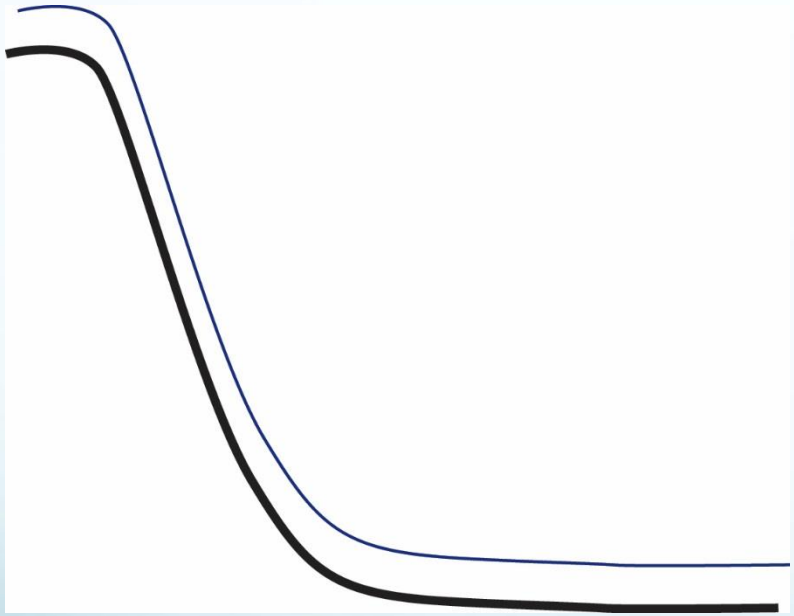
- Throughput is the *result* of achieving your organization's purpose for existence
  - No sales deliveries ➔ No financial profits or jobs
  - No successful peace negotiation ➔ No greater peace for mankind
  - No successful surgical procedures ➔ No greater "quality of life"
- Throughput refers to what your organization does that justifies the attention of your final customers
- Note that identifying who your customers or stakeholders are and what they each want is *very* enlightening

Optimizing Throughput

- According to the Theory of Constraints, increasing process throughput *only* occurs by increasing the *useable* capacity of the single, systemic constraint or process bottle-neck
- Rarely is there more than one simultaneous central constraint
- So how do you FIND the central throughput constraint?

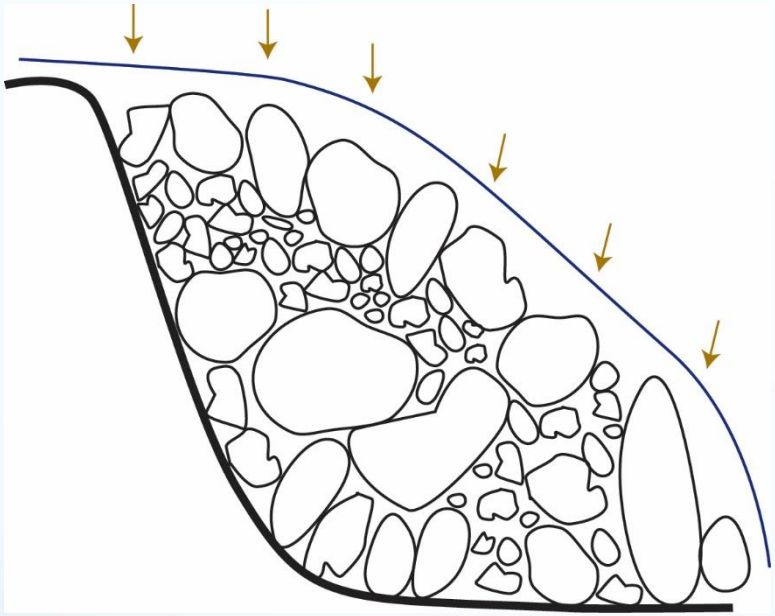
The Sluice Analogy

Sluice Analogy – Theoretical Design



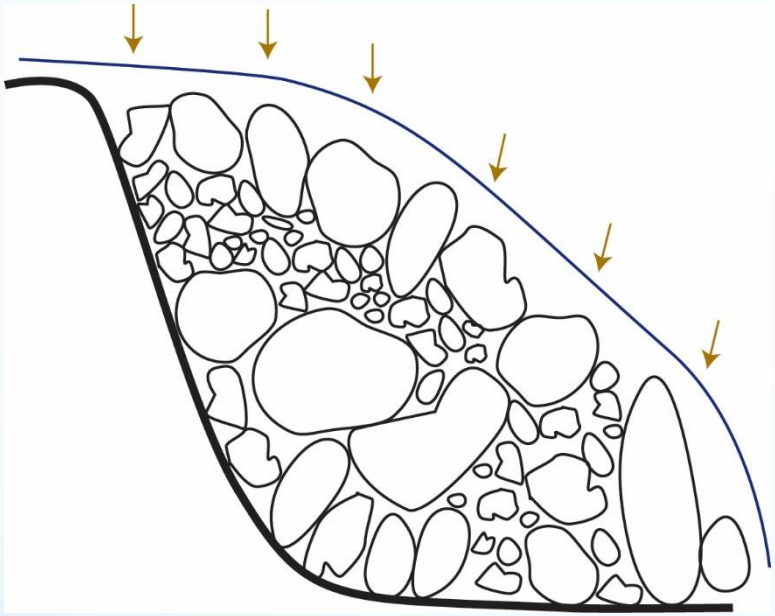
- You have arrived at a hydro-electric dam overflow sluice
- Designed to quickly & efficiently move water rapidly down-stream
- No backflows, whirlpools, eddies or dead-space
- Very little water
- Very short transit times

Sluice Analogy – Actual Function



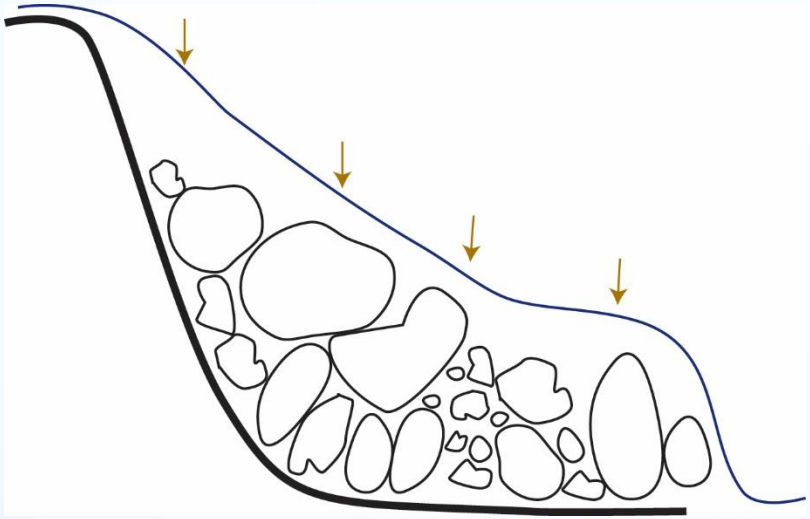
- Avalanche fills the sluice
- This is an uncannily accurate depiction of the actual function of many operations across economic sectors because they are designed & optimized vertically
- This disaster is a byproduct of experts working in isolation from each other
- One can only see the visible (top) constraints (or large rubble in this example)

Sluice Analogy – Actual Function (continued)



- Flows are a mess! (black holes)
- There is a lot of water and it stays in the sluice a long time
- Object of continuous improvement: pick the largest rock impeding full system flow for the entire sluice--**this is the central constraint or "bottleneck"**
- Warning: sometimes they wear Gucci's or boots

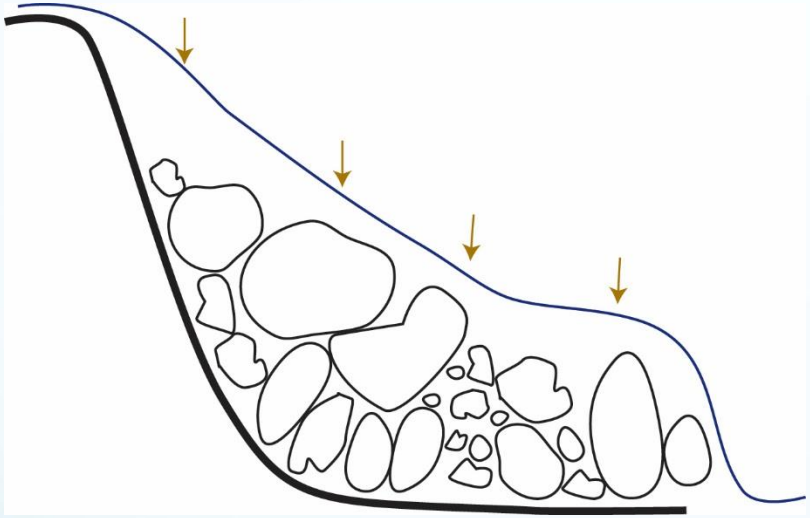
Sluice Analogy – Improved Function



- As you remove big rocks from the water flow, you will receive these results:

1. Fewer backflows, eddies & diversion
2. Less water in the system because you have removed the impediments (inventory reduction)
    - Inventory reduction is not magic or coincidence, it is due to removing sequential supply risks in the process

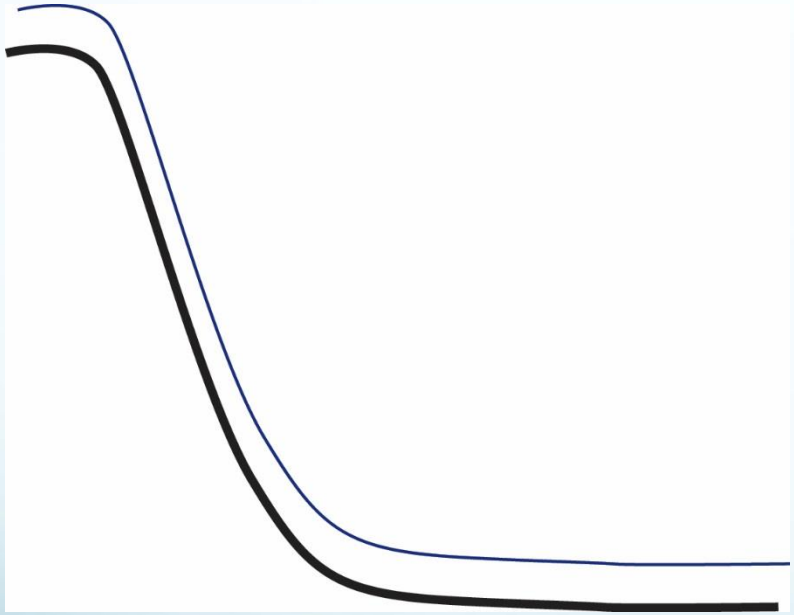
Sluice Analogy – Improved Function (continued)



1. Water entering takes less time to leave the sluice, yielding better “throughput” time

   Example: If 1/3 of the impediments to flow have been removed, your throughput time will drop to 2/3 of the original delivery time (i.e. 12 weeks to 8 weeks or 3 hours to 2 hours)

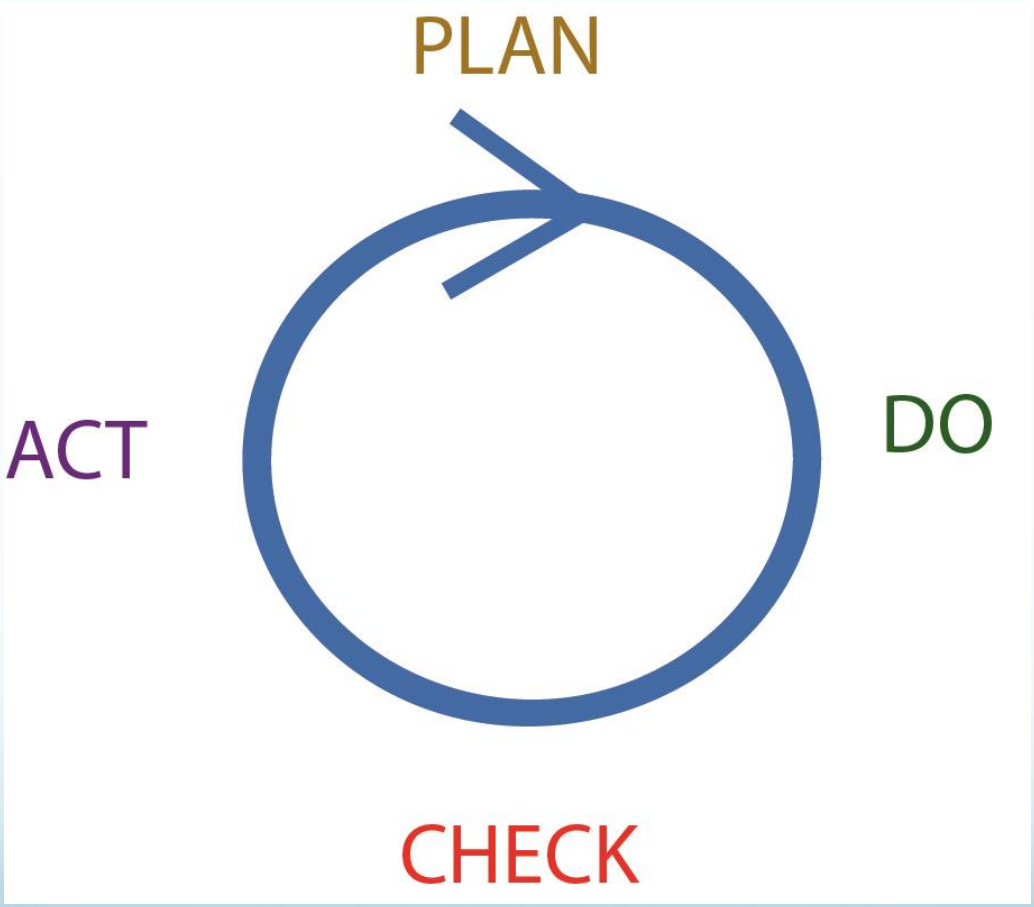
Sluice Analogy – Realized



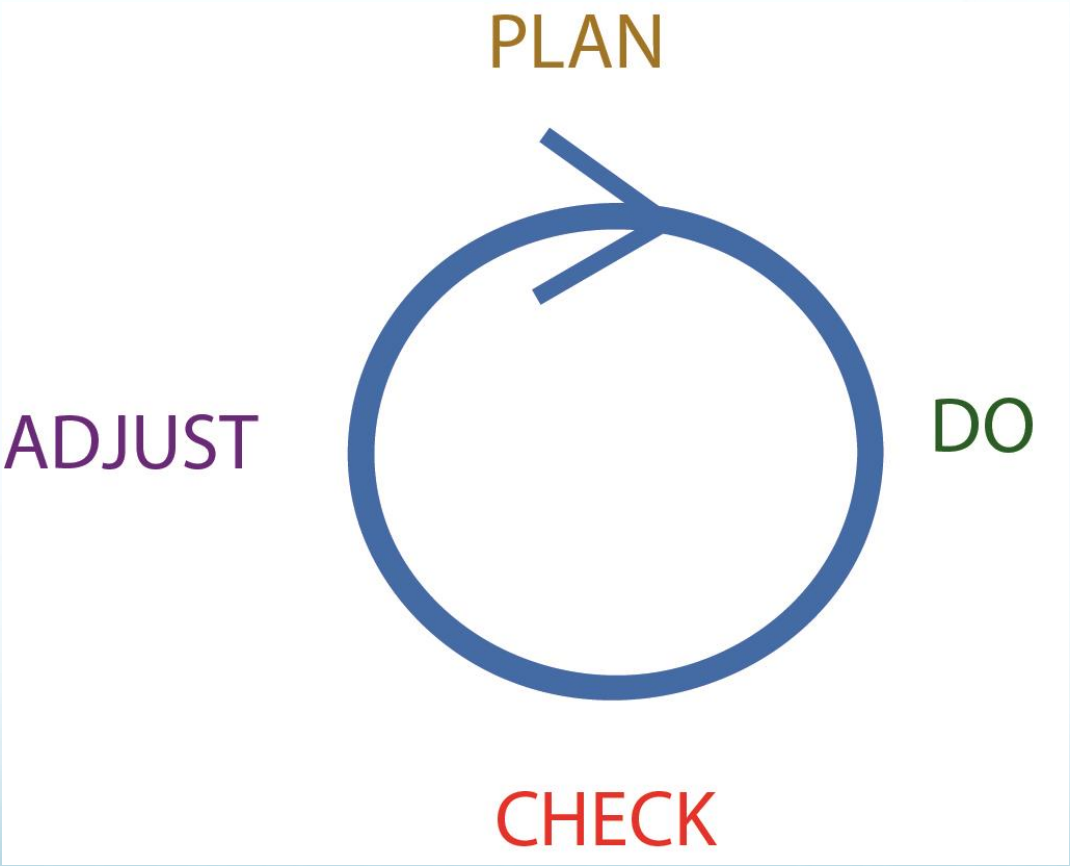
- Theoretical meets actual!
- Continuously remove the largest obstacles over and over
- Current (pun intended) inventory drops
- Throughput time drops
- Errors drop
- Results in an actual realization of what this process was intended to achieve

PDCA: Problems & Perspective

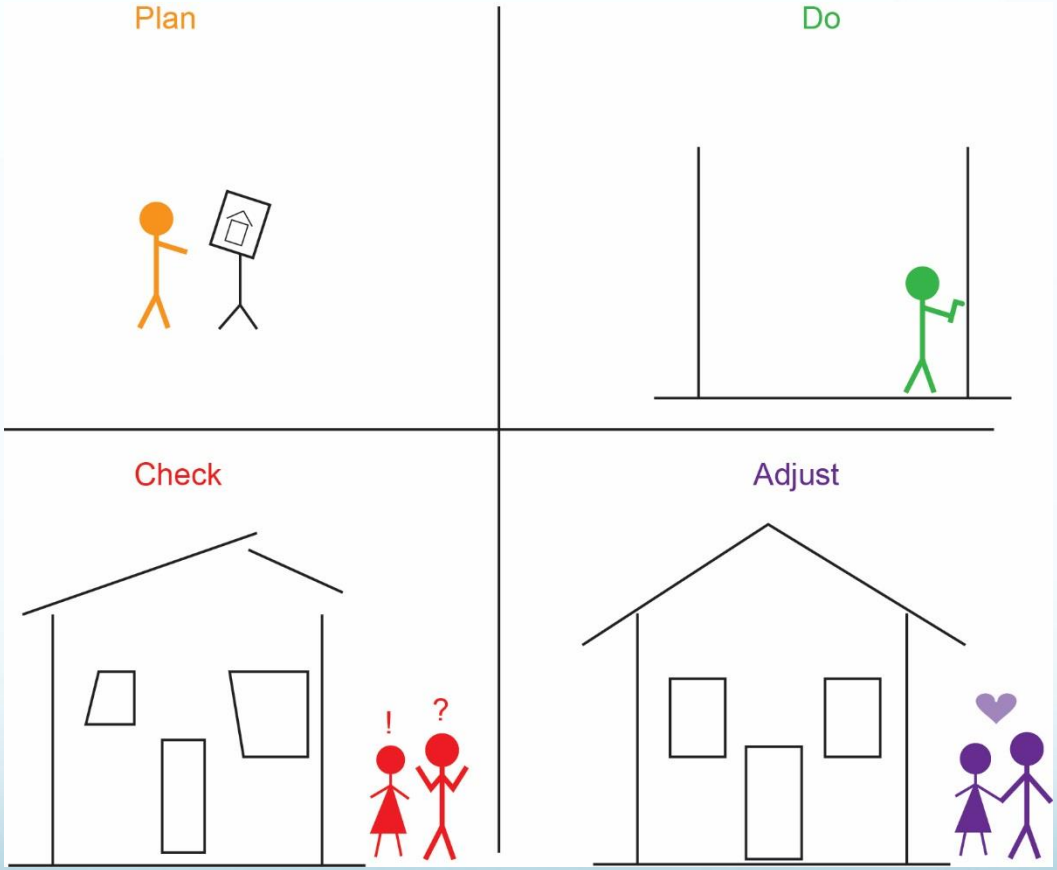
PDCAct



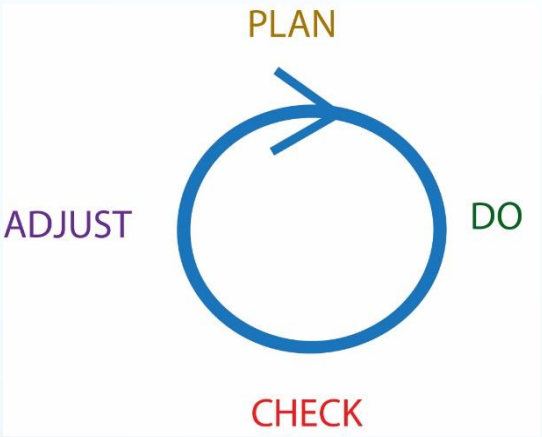
PDCAdjust



PDCA – House

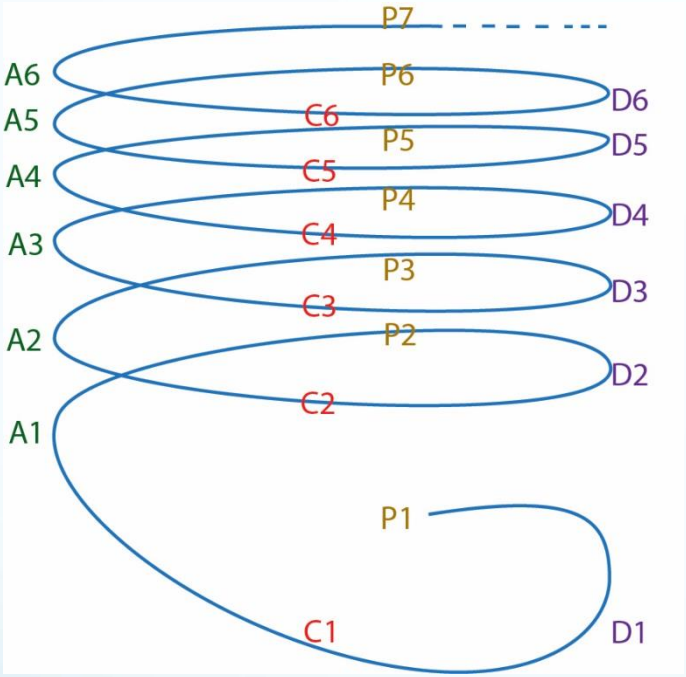


Dangerous PDCA Rendition



- The “P” stands for either “Plan forever” or “Perfect in one shot”— both are Dangerous!!!
- Underlying, unspoken expectation that it will be done right THE FIRST TIME! Example: Barrel washing
- This rendition freezes organizations, departments & people
- Lack of continuous improvement yields being passed by the competition
- Lots of blaming and finger pointing…versus actual continuous improvement
- **It typically takes 4-6 iterations to move from chaos to self-sustaining smoothness**

PDCA Helix – Tactical View

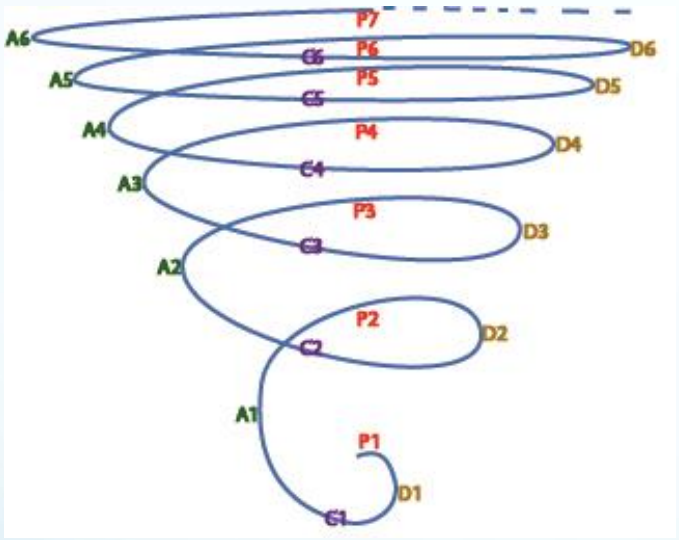


- Helix: the answer to instant perfection expectation
- This is not a flat, 2D rendition, but a 3D entity like an ascending screw with 4-6 threads (iterations)
- Each cycle is its own PDCA project
- With each cycle you will experience improvements in 1 or more of the following metrics:
  1. On time, complete delivery reliability
  2. Cost
  3. Quality
  4. Production flexibility (the quantity you do)
  5. Mix" flexibility (the variety of what you do)
  6. Materially less HASSLE!

What Prevents Helixes?

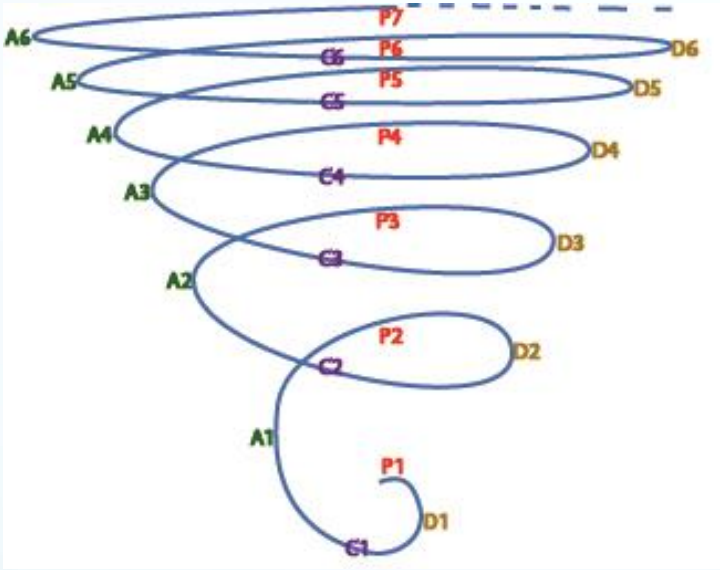
- FEAR!
- Fear of intra-organizational backlash (politics)
- Fear of seeing the defects in your organization
- Fear of being fired/judged if it's not perfect in one shot (this is very real)
- Edward Deming: drive out fear or perish; your organization will not be able to adapt
- Driving out fear accomplishes 2 things:
  - Eliminates expectation of one-shot perfection so current abilities *can* be used to further your organization
  - Performance expectation shifts from perfect-in-one-shot to TAKE YOUR BEST SHOT QUICKLY!!!

The PDCA Tornado



- The shift from instant perfection to take your best shot quickly drives the tornado
- The speed between and within the cycles changes the *helix* to operate more like a *tornado*
- Again, it typically takes 4-6 iterations to move from chaos to self-sustaining smoothness
- Most common response: “You’ve got to be joking! 4-6?!”

The PDCA Tornado (continued)



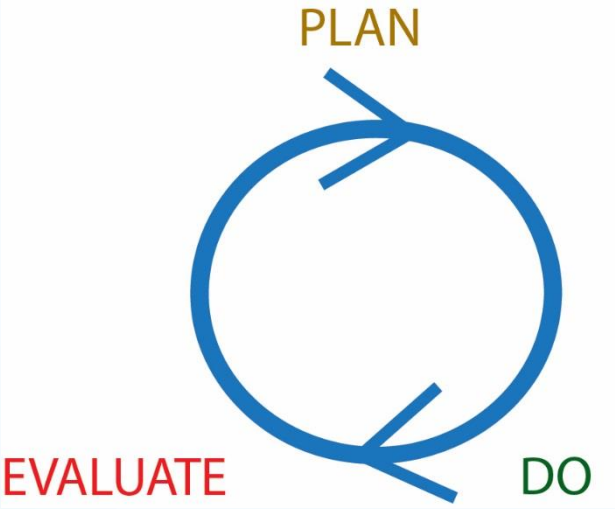
- Why are you working on this project? Is it the central constraint (biggest pain in the neck with lots of babysitting) or not?
- Perfect-in-one-shot fixes don't work; they perpetuate chaos
- If the perfect-in-one-shot (silver bullet) fixes worked, would you be where you presently are?
- Identify underlying constraints & reduce hassle by running tornado-like PDCA cycles.
- It will take a lot less time to *iteratively improve* the system, 4-6 times than it has taken to babysit it for the last number of years

The Helix Trap

- The “trap” is calling your process “take your best shot quickly” multiple phases; but in fact, trying to make it perfect in one shot
- I know from personal experience
- Each successive plan phase will show you things that you could not SEE before, and therefore could not plan for earlier
- The fastest way to get to phase 3 Plan is to rapidly take your best full-PDCA shot at phase 1 and learn what you learn and see what you see
- Then, with this information, take your best full-PDCA shot at phase 2!
- This is the fastest, most efficient, best… and *only way*

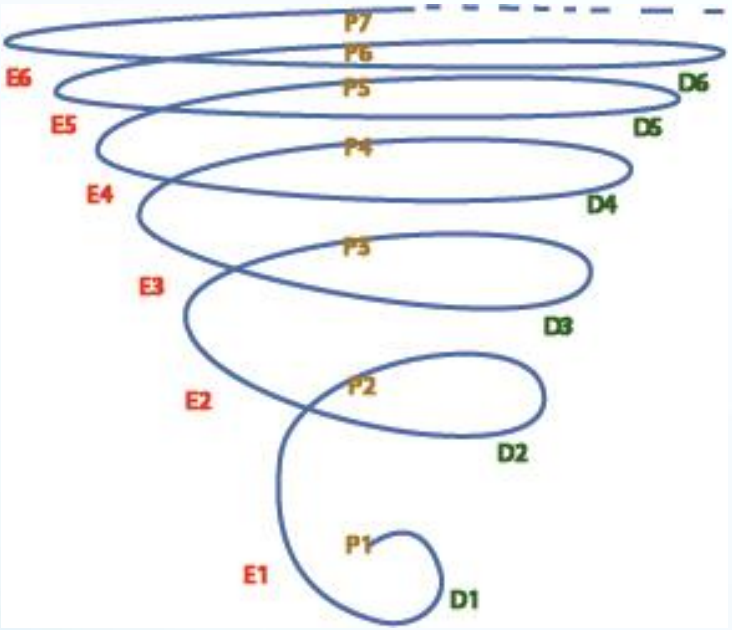
Strategic Continuous Process Improvement

Strategic CPI



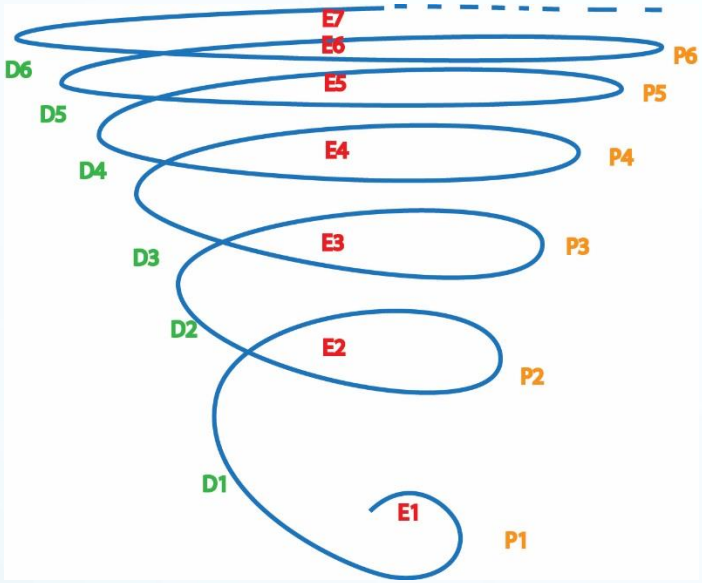
- Rewrite cycle as Plan, Do, Evaluate
  - Evaluate includes check & adjust, but is much more than an after-the-fact action
  - Evaluate is not merely a check-the-box step
  - There is no point in evaluating something that you are not going to impact/improve in some manner

PDE Tornado



- Including the Evaluate step makes more sense when viewed in the manner of a PDE tornado-like-ascending-helix
- The cycles are stacked on top of each other in rapid-execution style
- In this rendition, the “Evaluate” step becomes the ***link*** between each successive iteration
- However, consider your perspective from the Plan step of the 1st cycle of a tornado:
  - “***Why*** are we focusing organizational resources on *this particular project?”*
  - **IS** it the central throughput constraint?…or ***not***?

EPD Tornado



- Proposal: instead of placing the Evaluate step at the end of the improvement cycle, consider re-portraying the rapidly repeating cycle as "Evaluate", "Plan", and "Do" (EPD) and then stack 4 to 6 iterations on top of each other a tornado!
  - Evaluate = strategic step
  - Plan = tactical step
  - Do = execution step
- Each cycle has all 3 components
- Terminate when “Evaluate” reveals a “bigger rock” elsewhere in the “Sluice”

Yeah Buts…

Discovering Yeah-buts…

- What is a Yeah-but…?
- I used to HATE Yeah-buts: I'd work on a proposal with team members only to have it shot down in flames
- Until one day I realized that the Yeah-but was actually how the System really operated…
- Invisible to the managers/owners
- Everybody in operations/office/engineering (pick a department) knew it was there, probably as a work-around within the present system that they couldn't change, so it wasn't worth discussing except to update it
- It wasn't until the Yeah-but was threatened by this proposal that it even came to management's attention at all
- Obviously, if management had known it was there, it would have *been* in the present proposal!

Dealing with Yeah-buts…

- That's when I realized the yeah-but was the *real* systemic constraint!
- I also realized that we had just exited the previous iteration and were about to go kicking & screaming into the next iteration with the actual constraint *in hand*
- We were to scrap the last proposal and redesign it with the critical information bubbled up by the yeah-but
  - Example: Soda pop bottle shaken up…the central constraint now becomes obvious, bubbling up and yelling: "Pick me! Pick me!"
- The yeah-buts are usually the *demarks* between PDCA cycles
- This produces tornado-like improvement! – *Bring on the Yeah-buts!*

Processing Yeah-buts…

- Yeah-buts are unseen, invisible, but very real constraints
- They remain hidden in desktops and toolboxes
- The object is to rapidly (& perhaps rabidly) flush out the yeah-buts to determine if it's legitimate or not:
  - If not, you remove it (i.e. visual inventory 6 times)
  - If it is, you redesign the process
- This *drives* the helix − you redesign and re-implement your process to handle the yeah-buts
- As you DO this repeatedly, your processes will become faster, cleaner, more productive and a whole lot less hassle!
- Yeah-Buts are actually your friend. ;-)

Care & Feeding of Yeah-buts…

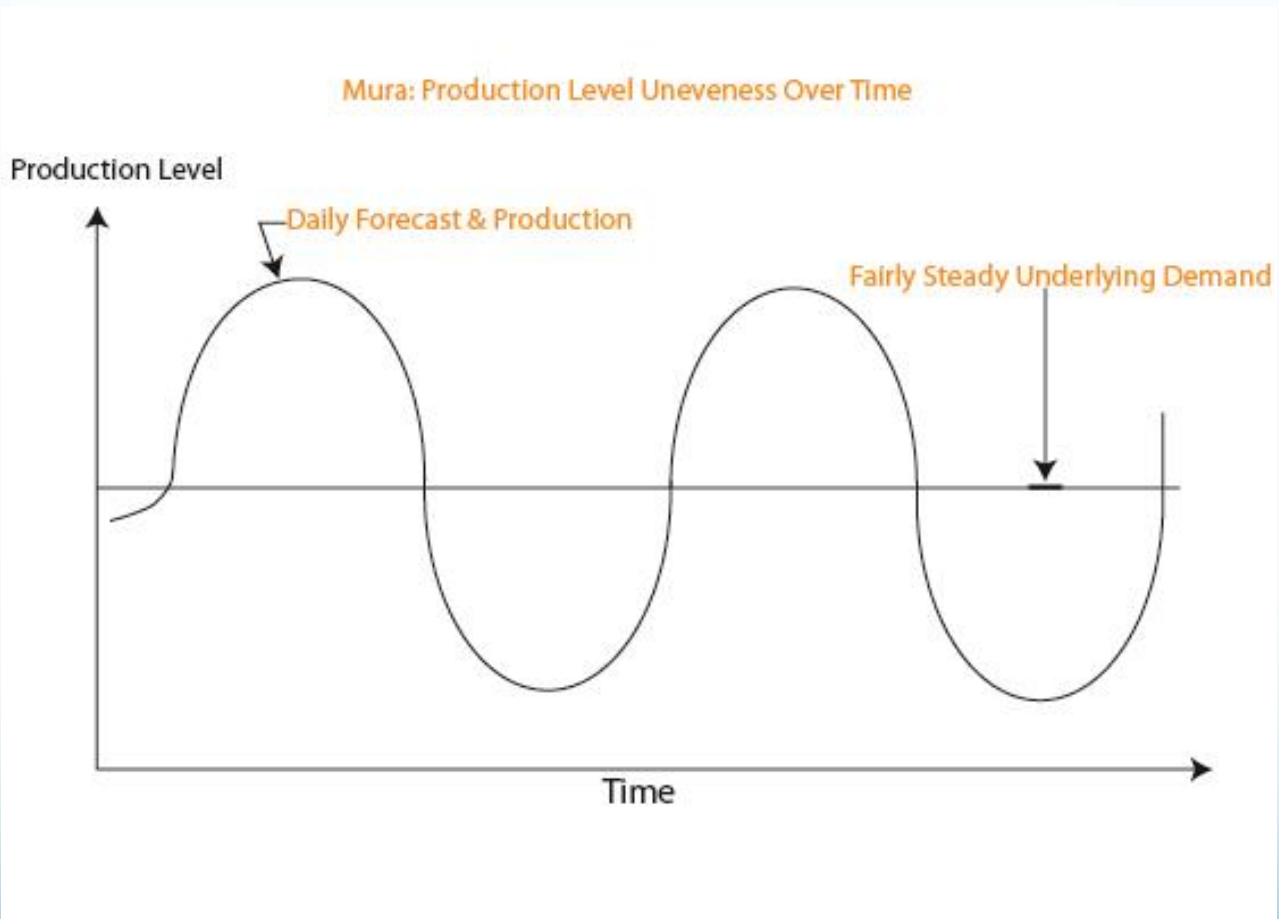
- The work-arounds created and maintained (in some cases for years) by the Yeah-but Caretakers are why your organization still exists, why you have been able to create *anything* in any amount of time &/or quality
- Handle with care and respect: We are trying to hunt down and kill constraints and ineffective systems, not the very people who have been delivering value to your customers for years (or decades)
- Use these people's talents more effectively!

Lean Thinking: Wastes & Remedies

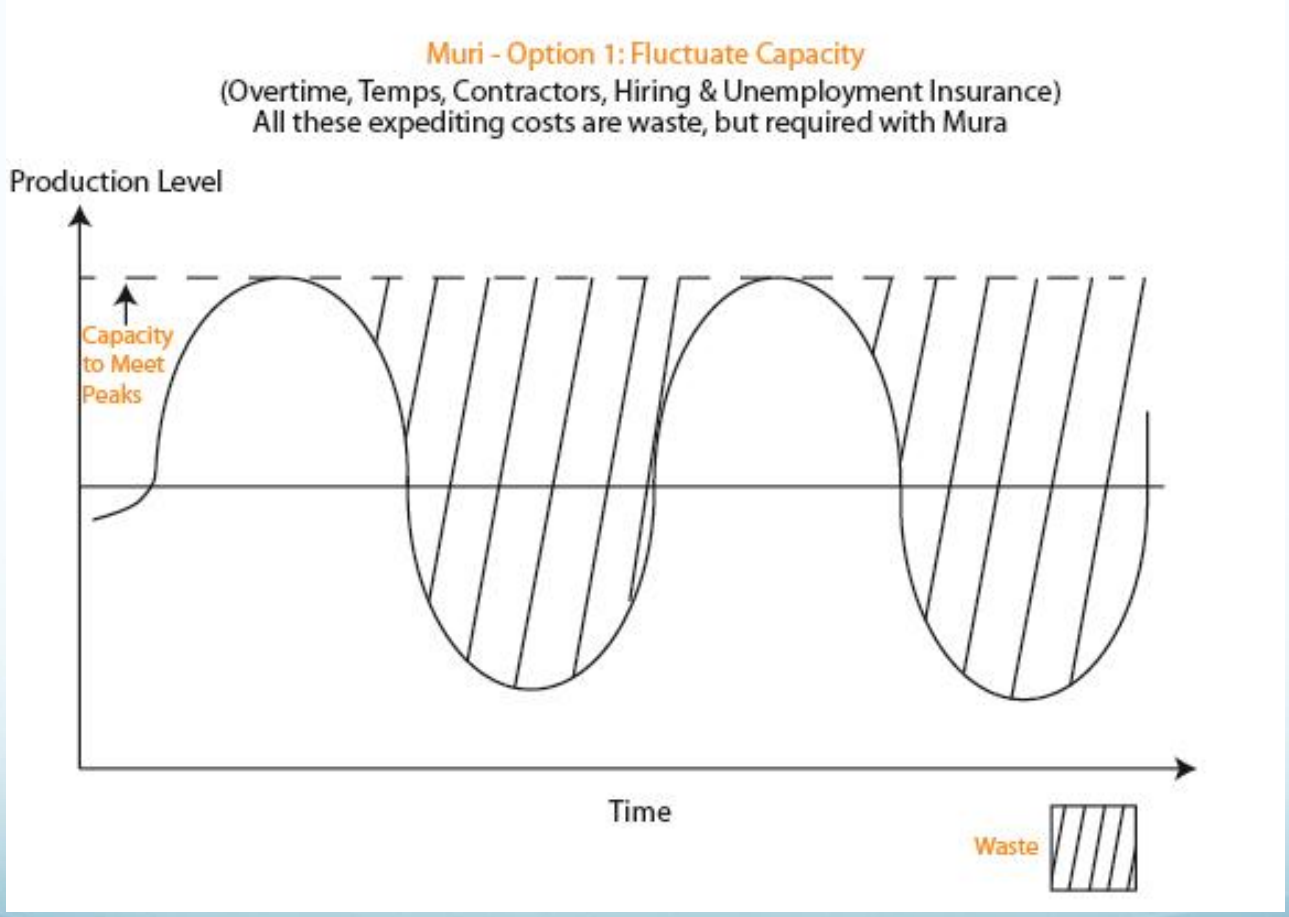
Overall Lean Wastes

- Mura – Unevenness
- Muri – Overburden at peaks of unevenness
- Muda – Waste

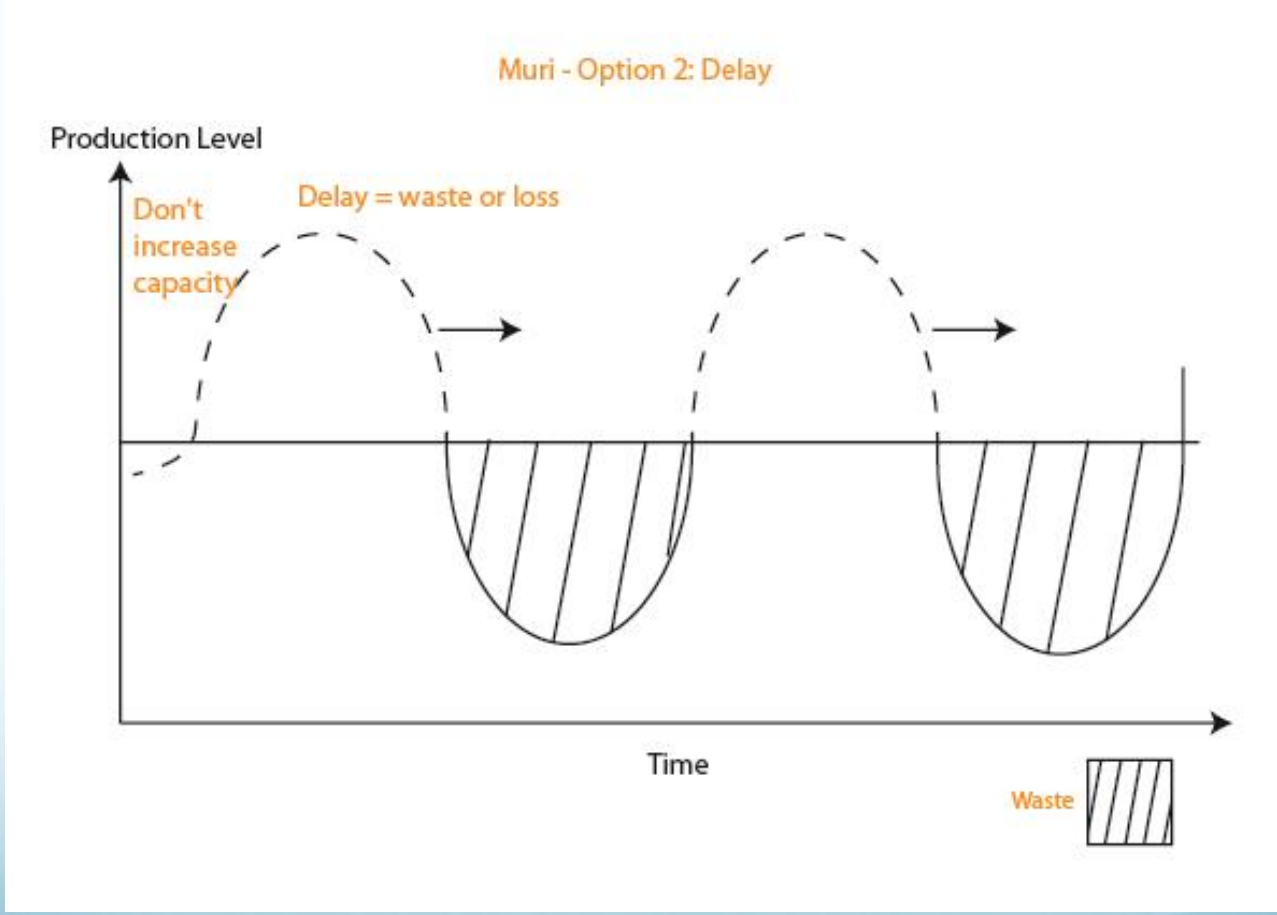
Mura – Uneven Production



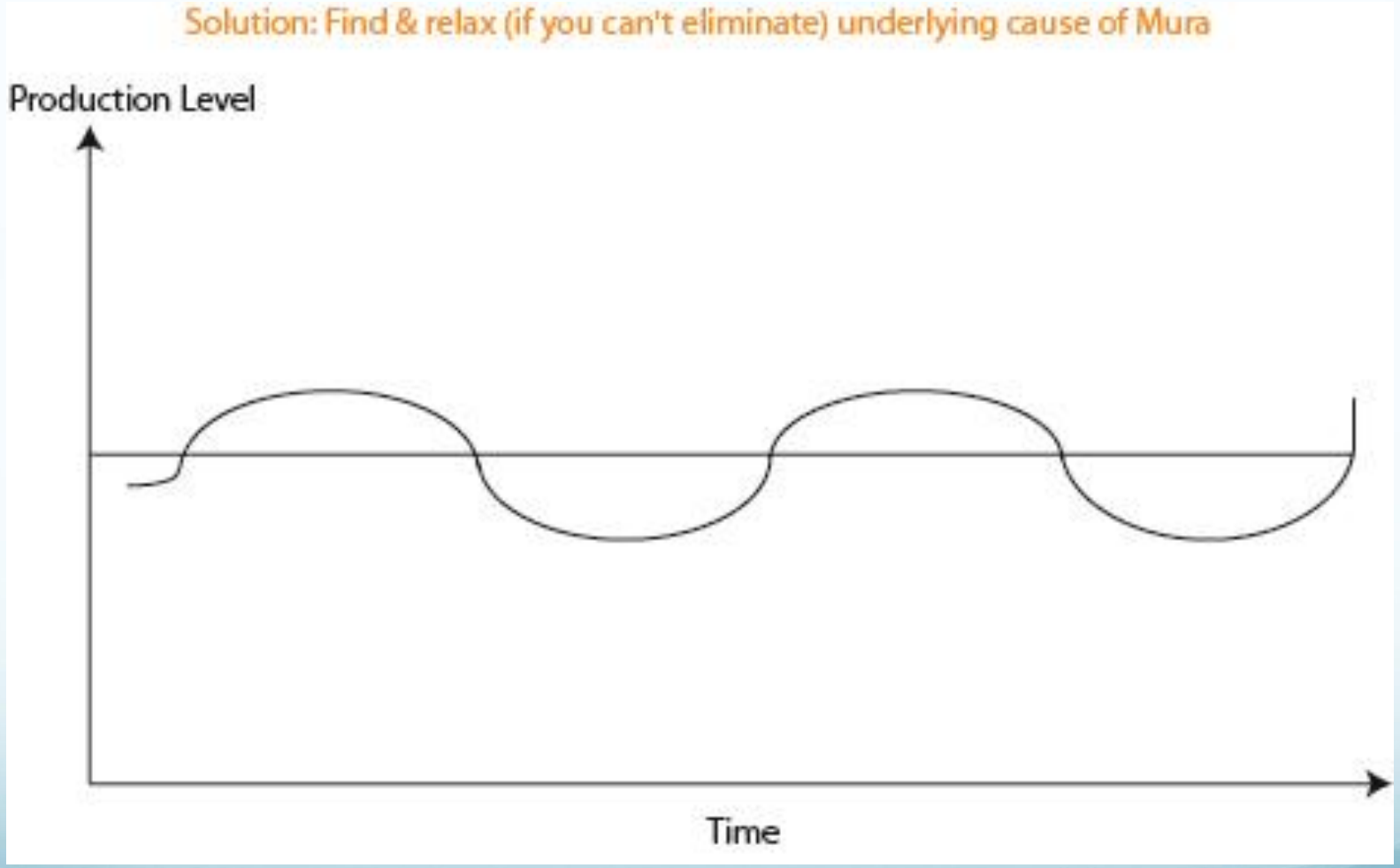
Muri – Overburden at Production Peaks



Muri (continued)



Mura Solution – Less Variation



Muda - Lean Thinking Wastes

- **D**isengagement of people via chronic hassle *
- **O**verdesign of goods and services which do not meet user needs *
- **T**ransport of goods unnecessarily
- **O**ver-processing unnecessarily
- **W**aiting by employees for process equipment or staff to finish their work on upstream activity
- **I**nventory of goods awaiting further processing
- **S**kills Mismatch for task assigned *
- **D**efects in delivered products &/or services
- **O**verproduction of goods not needed
- **M**ovement of people unnecessarily

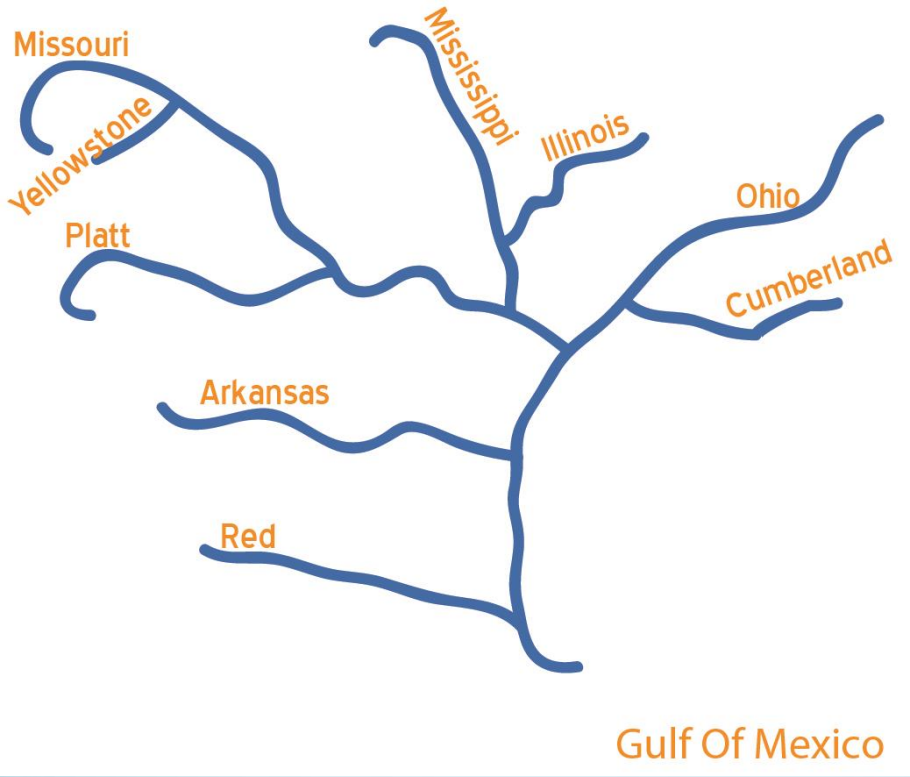
Pneumonic acronym: **DO TO WISDOM**

** Added after Ohno's original 7 wastes.*

5 Steps of Lean Thinking

1. VALUE: Define value according to the *end*-customer [5% of time]
2. VALUE STREAM: Create current and future Value Stream Maps [10% of time]
3. FLOW: Change your current process to your defined future state value stream process [75% of time]
4. PULL: Proof the future state value stream process… run it faster to see where it *yelps*!
   [10% of time]
5. PERFECTION: repeat first 4 steps

Value Stream Mapping



- Mississippi Basin
  - Value delivered at Gulf of Mexico
  - Bayou (obsolete finished goods inventory!)
- Would the end-customer complain if you removed this step?
  - If Yes! ➔ Value
  - If No ➔ ask
- Can I get rid of this step now?
  - If No = Type 1 Muda (not yet)
  - If Yes = Type 2 Muda (get rid of it, redraw map w/o Type 2
  - Then DO IT!

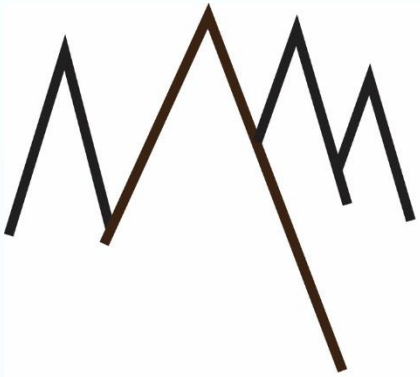
Lean Waste Example (if time)

- Frank Galbraith (Cheaper by the Dozen)
- Brick Laying

- What are the major wastes in this story? (No peeking!)
- Movement
- Transport
- Waiting
- Defects

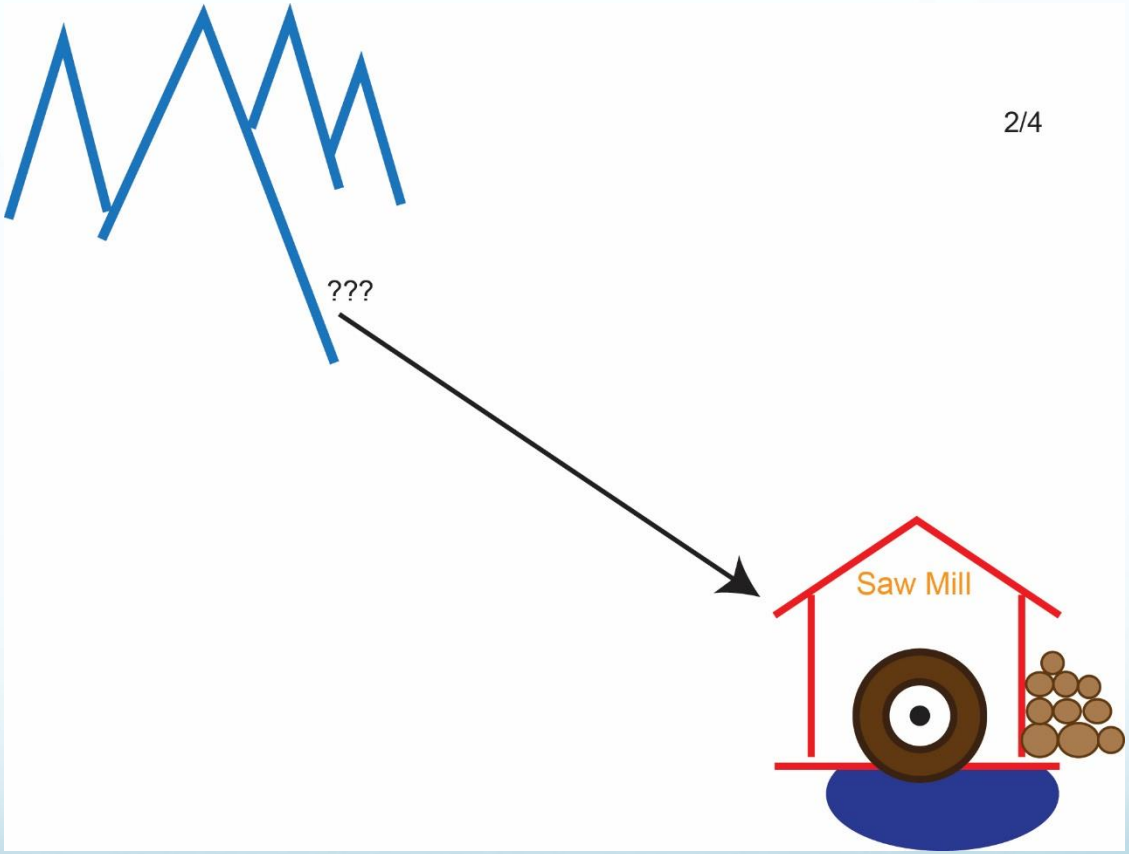
Schools of Lean Implementation

Paul Bunyan School

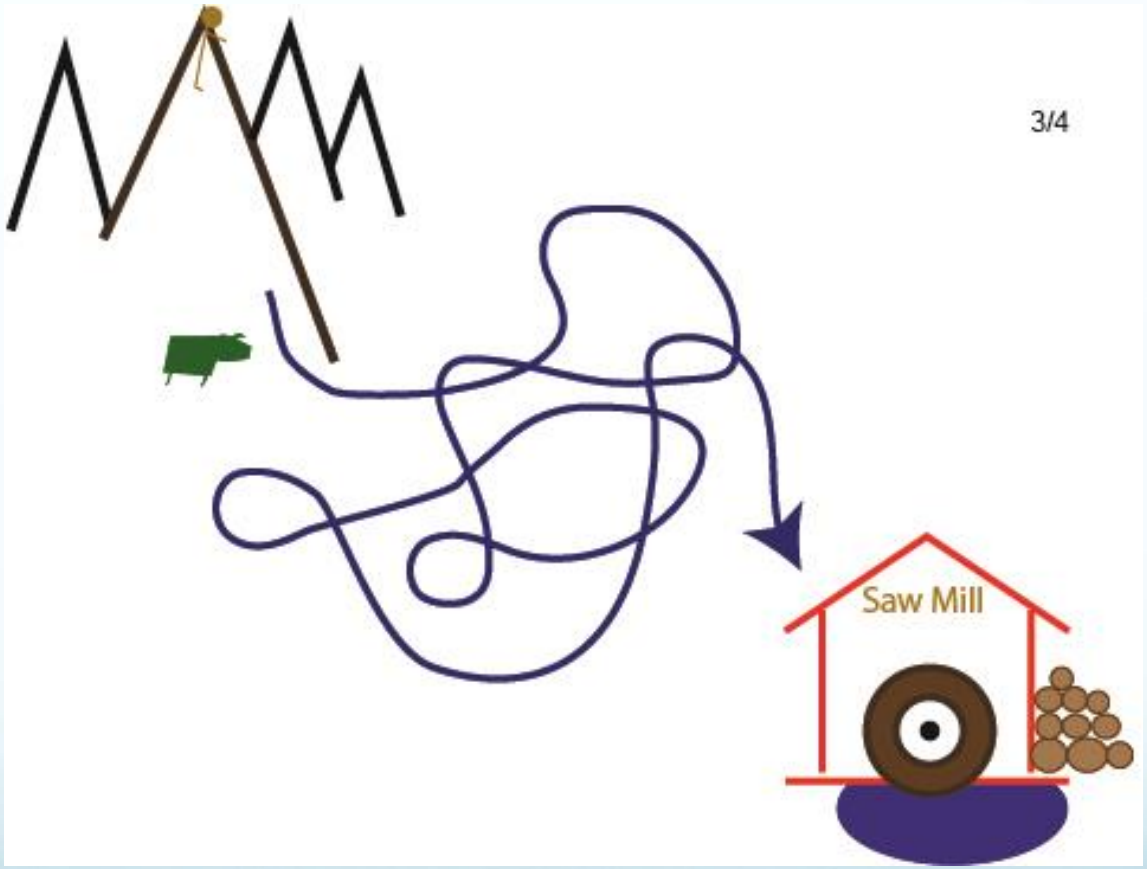


1/4

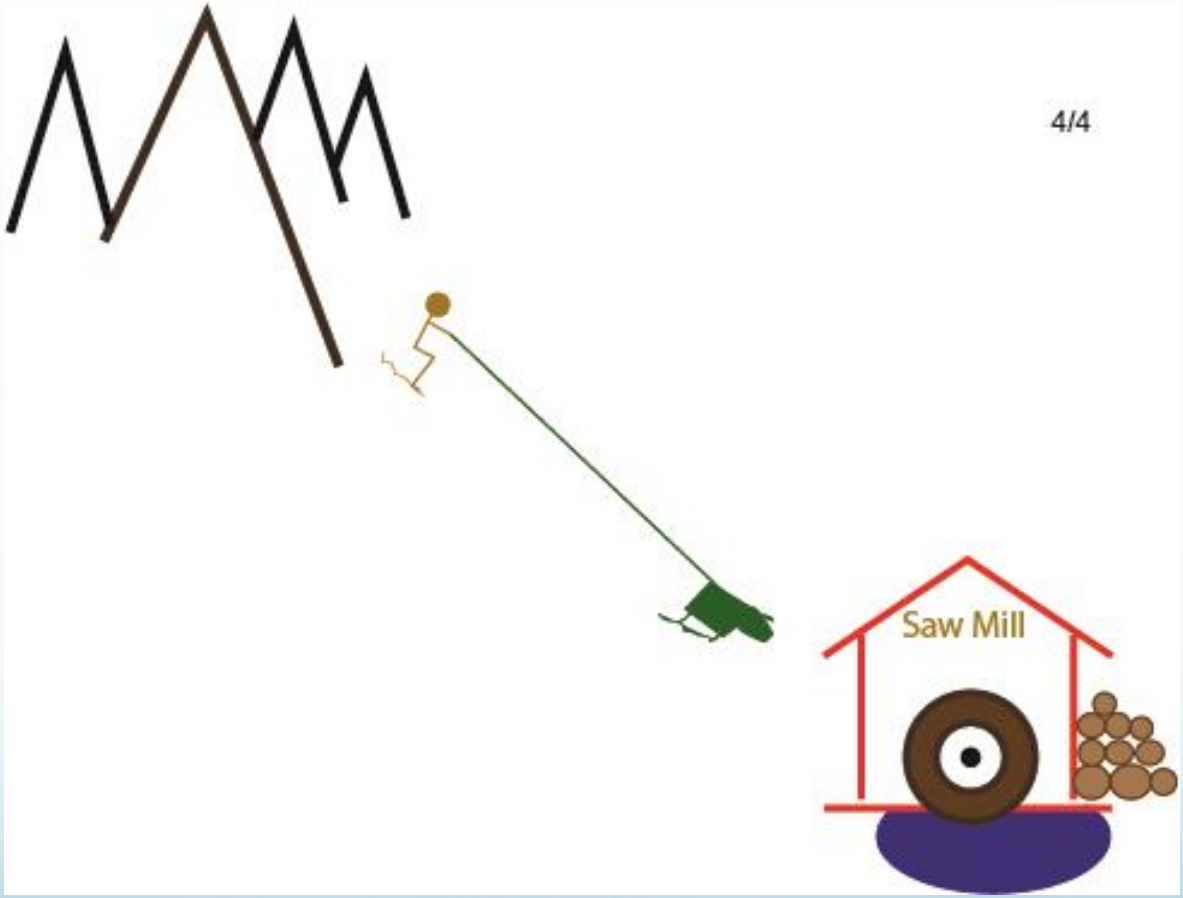
Paul Bunyan School



Paul Bunyan School



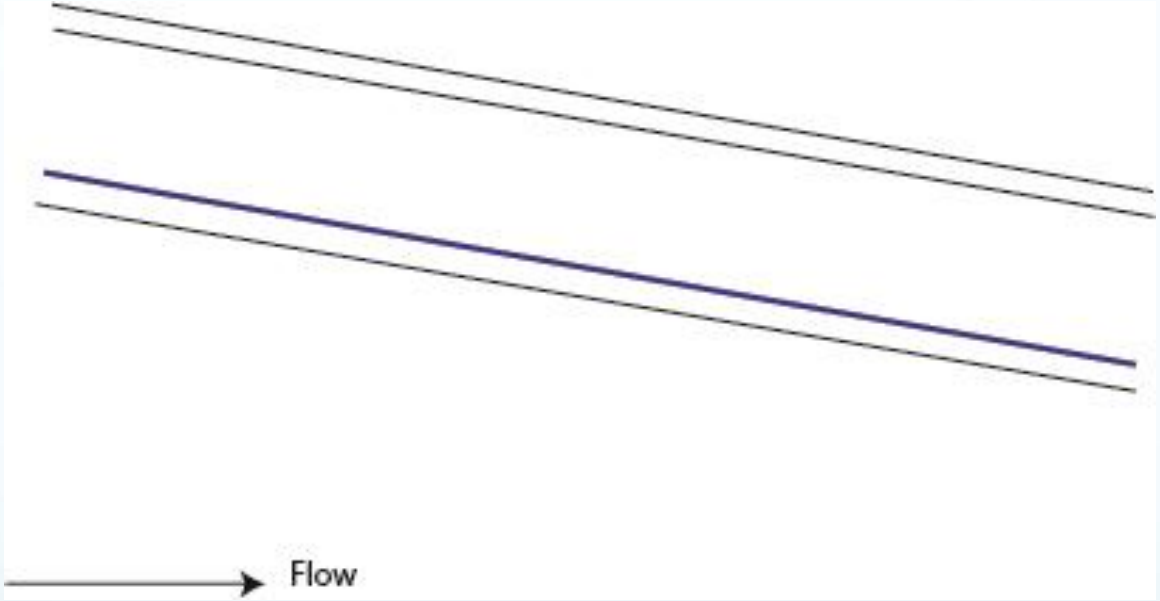
Paul Bunyan School



Farmer's School of Lean Implementation

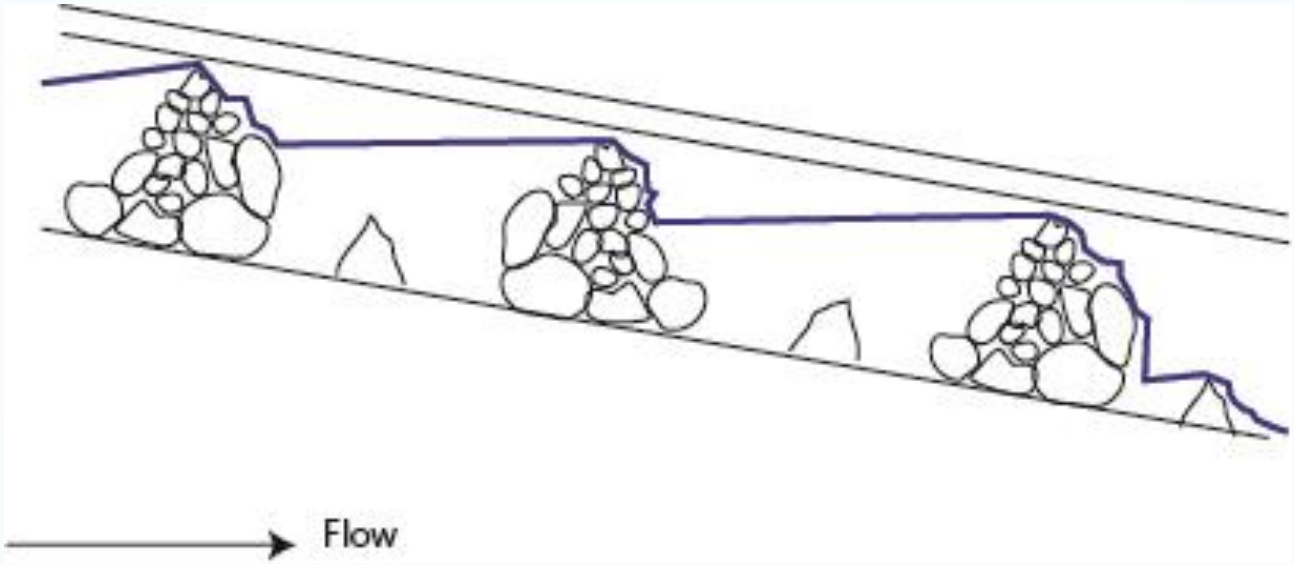
So, what do you do when there is more than one "Biggest Rock" in the process? What Then?

Irrigation Ditch - Expectation



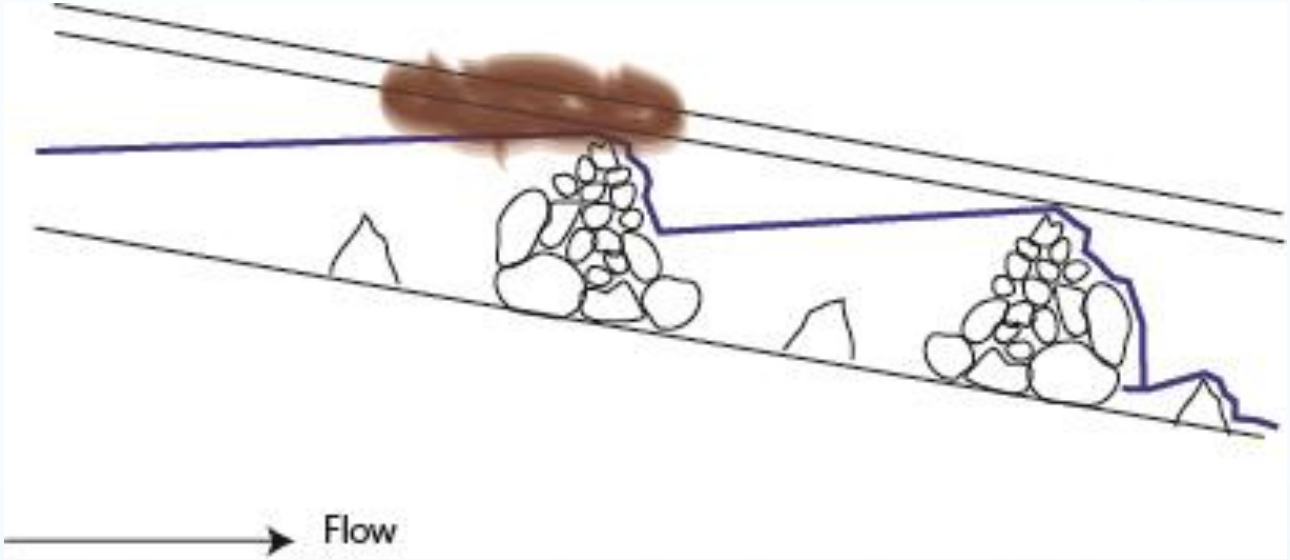
What the farmer thought the irrigation ditch looked like

Irrigation Ditch - Actual



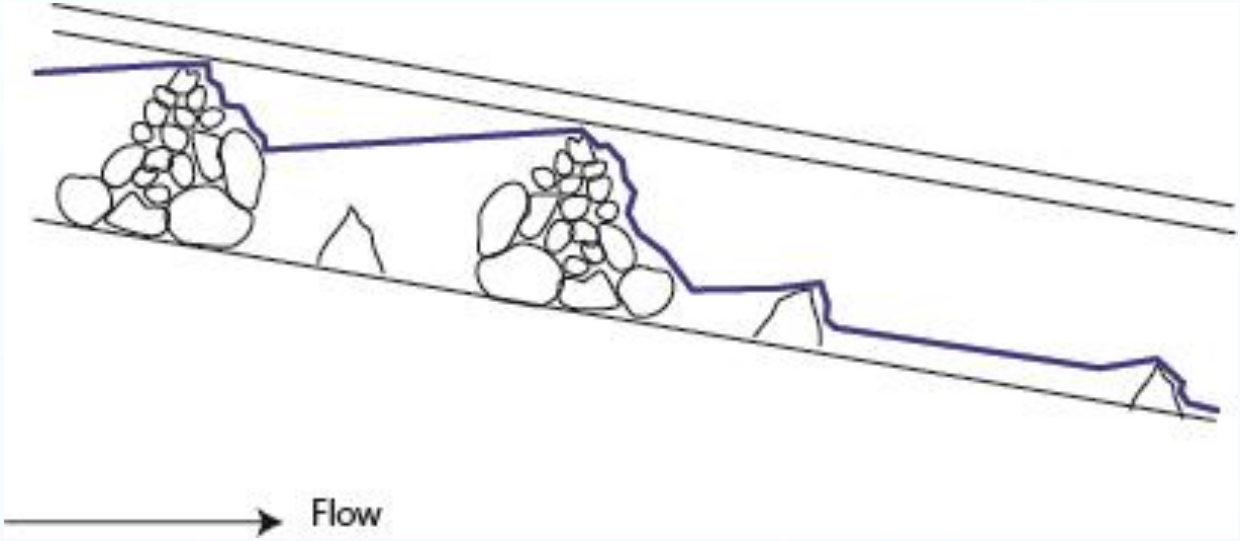
- What it *actually* looked like
  - Multiple major flow blockages
  - Lots of “Inventory” (Perhaps even “floods”)
- So in what sequence do you fix it?

Beginning to End Repair



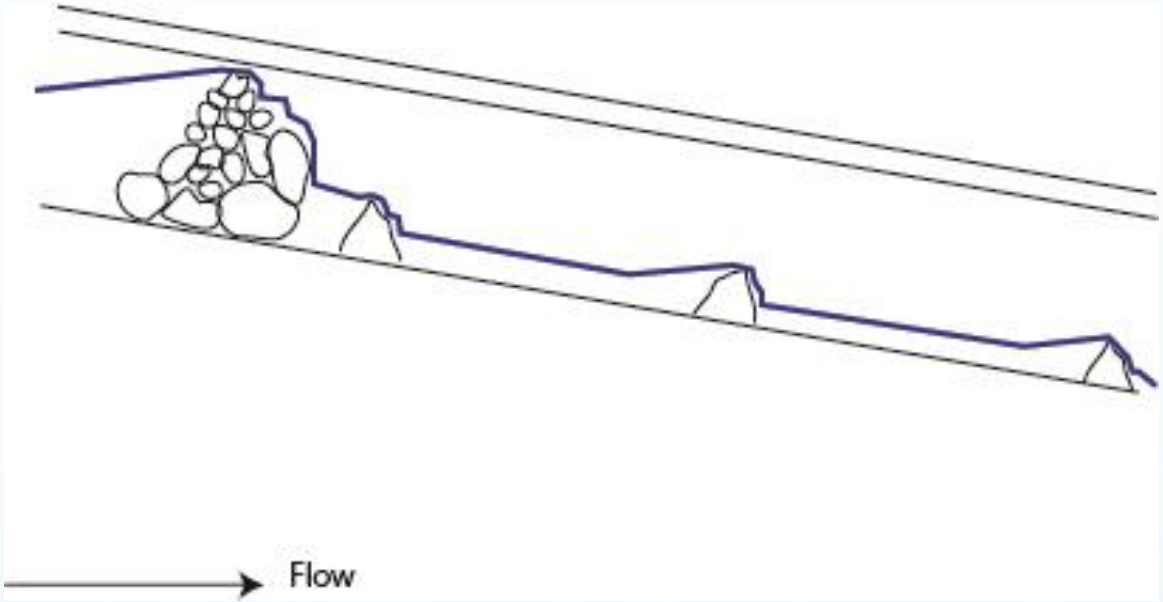
- Consequences of fixing the system from beginning to end:
  - Mud everywhere at the next major rock pile: you can't SEE what's going on
  - Overtime with no capacity to change at the next rock pile

End (Closest to Customer) to Beginning Repair – Phase 1



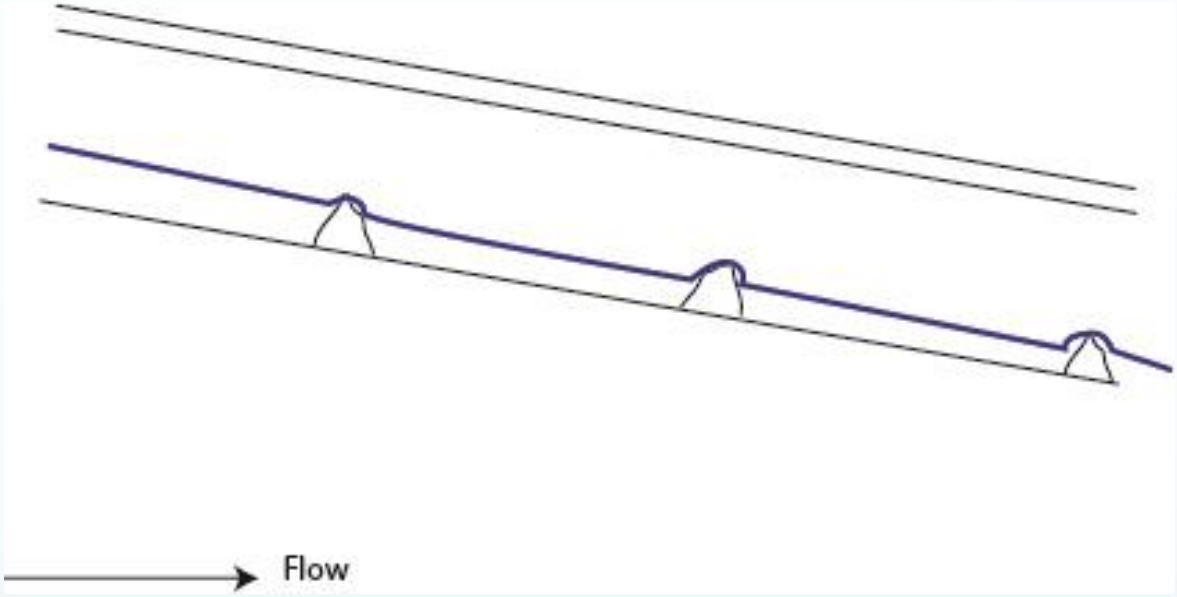
- Consequences of fixing system from end to beginning:
  1. Water flows out of system
  2. You can SEE what's going on at the next biggest rock pile upstream
  3. You get to reclaim the water that was behind the impediment closest to customer (i.e. sell inventory ➔ $ in)

End (Closest to Customer) to Beginning Repair – Phase 2



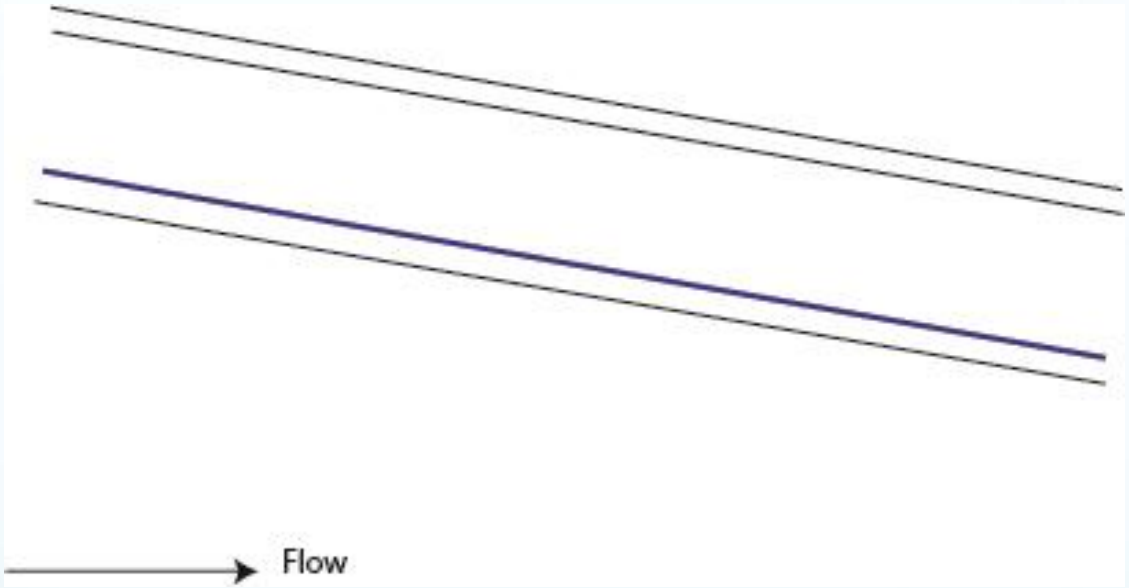
Summary: fix the biggest impediment closest to the customer first

End (Closest to Customer) to Beginning Repair – Phase 3



Flow vastly improves

End (Closest to Customer) to Beginning Repair – Phase 4



- Ideal sluice-like flow
  - Very short throughput time
  - Very little inventory
  - Much less waste

Wrapping Up

Navigating TOC-Lean-Sigma Alphabet Soup

- There are between 100-400 tools in these, depending on who you ask
- Reason for a given tool: applicable to many industries
- People got tired of saying the whole name ➔ Acronyms
- TQM, ZQC, SMED, 6S, OEE, etc.
- **DON'T SWEAT THE ACRONYMS!**
- Establish FLOW and PULL to find the *NEXT* weak link, and then learn & do the established tools
- Client library (leanmfg.com/wordpress/resources/recommended-reading/)

Impediments to Successful Sustainability

- Pervasive “Perfect in one shot” expectation
- Failure to identify Root problems
- Internal politics

System Development Sequence

- Why to Change? (Current State – Business Need)
- What to Change? (If not Central Constraint, why not?)
- What to Change to? (Future State - Charter)
- How to Change? (Constraints & strategy to move from “Current State” to “Future State” - Project)
  - ↓ Risk
  - ↓ Interruptions
  - ↑ Profit
  - ↑ Valuation ≅ 5x – 8x (+) Net Income

Coaching

- Why to: can coach
- How to: can coach
- Want to: We heed the wisdom of that Great Scout Camp campfire Indian Chief:
  - Yagottawanna

Break

- 5 – 10 Minute Break

First Project

Just Cause

- Identify the firm's or the process' "Just Cause"
  - Is not owner benefit: security, ROI, etc.
  - Is Multiple-Stakeholder Benefit: WHY does the organization exist from each stakeholder's point of view?
    - Preferably across time

Discovering Your Just Cause

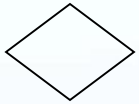
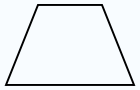
- Clue 1: Who ARE your internal and external stakeholders?
- Clue 2: What suffering occurs or betterment doesn't occur to stakeholders when the organization fouls up?...Including those effects across time. (Specific list)
- Preventing those conditions is the organization's just cause for existence
- Note: Take your best shot. This one is going to have to iterate (See Helix)
- It IS something all stakeholders love to promote

Process Mapping

Mapping Materials

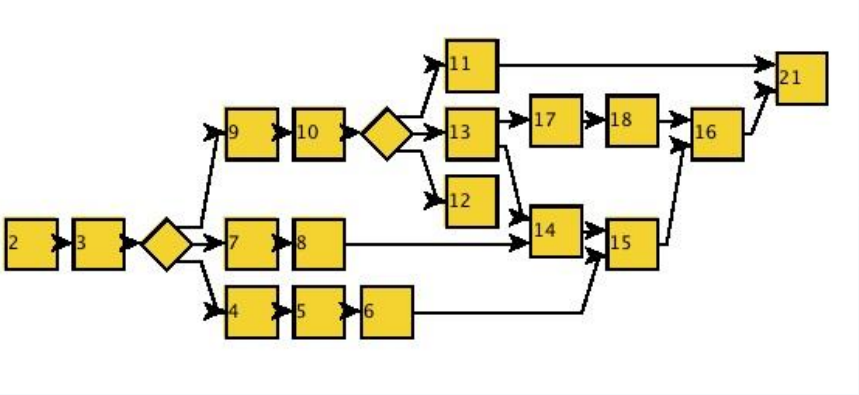
- Process Mapping from Concept to Collections
  - Use a PENCIL on 11x17 paper OR
  - 1 ½” x 2” post-it notes on coated wrapping paper (my personal favorite)

Map Symbols

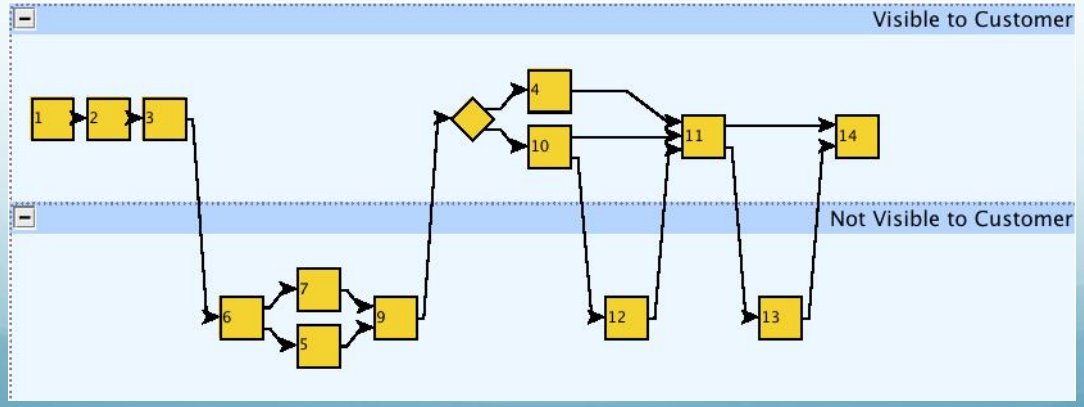
- Tasks 
- Decisions 
- Inventory 
- Decision & inventory symbols can just be written on the face of the post-it notes (if using them)
- Don’t get hung up in the symbols…just do it

Map Types

- Not customer visible (i.e. Manufacturing)



- Partially customer visible (i.e. Service)



Process Map Verification

Check your process map with the process

- Operators
- Consumers
- Vendors
- Administrators

Expectations

- They are all going to hate the 1st iteration! & you'll be swimming in "Yeah…Buts."
- Perfect…throw it out and do it again…flush out the "Yeah…Buts" as **fast** as you can!
- They will hate the 2nd one a little less…Ditto "Yeah…Buts."
- They will begin to scratch their chins by the 3rd iteration and ask "Can you DO that?"

Expectations (Continued)

- By the time “Yeah…But” driven changes stop coming and being solved around the 4th to 6th iterations, the process stakeholders will be wondering why it’s not done yesterday
- “Yeah…Buts” are a strategically beautiful thing! (Though tactical pains in the neck!)
- Resist the temptation to skip iterations…Take your best shot Quickly…over and over!
- You will SEE things at the Evaluation stage for each iteration that you COULD NOT SEE, and therefore could not plan for, earlier

Constraint (Bottleneck) Identification

- After the process map settles down, ask your team, “If we pulled 3% to 5% more of our “Just Cause” out of this process…where would it break?
- That is your highest-impact, organization-wide, central constraint. Start Here!
- Identify, learn and apply countermeasure tools that impact your central constraint. (I’ll steer you toward the tools; see Client Library on leanmfg.com)

Process Metrics

Process Measures for the Central Constraint

- This discussion is most useful after you have iterated your Concept to Collections process map and identified your *real* central process constraint
- Then the discussion is highly concrete to you versus just Ivory Tower theory
- By definition, every other step or resource in your process has excess capacity. So, if practical, the best place to *measure* your Concept to Collections process is at the central constraint itself

Process Measures for the Central Constraint (continued)

- For the introductory meeting, we'll discuss the following basic measures:
  - Delivery: Lead times (complete) from weeks to days
  - Quality: 50% reduction in defects per year
  - Cost: Inventory turns doubled in 2 years & again in 4; 20% - 50% space reduction in 2 years; 50% reduction in working capital/sales
  - Mix Flexibility: What mix you do; Training time from 5 years to 2 (or 1)
  - Volume Flexibility: How much you do
  - Speed to Market from years to months in 2-3 years

Just DO IT!

- Identify, learn and apply countermeasure tools on the central constraint… and Measure It!
  - Finding/acknowledging it is the hard part
  - Fixing it is the fun, creative, collaborative part
  - Your Central Constraints probably ARE the root causes of many of your chronic hassles and business risks
  - Therefore finding & reducing Central Constraints IS the process of simultaneously ↓Risk, ↓Hassle & ↑Profit.
- Then…start again with the ***next*** Central Constraint!
- Start between your doors and eventually expand to supply-chain-wide metrics.

JUST DO IT!

(Continued)

- TOC/Lean/Sigma is an Unfair Competitive Advantage!
- Just focus: Move Valuation [5x → 8x (+)] X [Net Profit]
- ↗↗ Company VALUE 200% to 1000% inside of 3 years.
- Now let's DO IT! Start with taking your best shot at
  - What is your Just Cause?
  - What is your process for reliably delivering it between Concept and Collection?
  - Or for non-profits, between Concept and Completion

Manufacturing Consulting Services, Inc. - Contact Info

- Tim Ward
- Email: C2C.tw.000000@leanmfg.com
- Site: www.leanmfg.com
- Slide Set: www.leanmfg.com/members/c2c-workshop
- Office: (801) 996-8910 / Cell: (801) 979-6787

2nd Section

- 1-2 weeks later, after you have checked and iterated your map with your firm's administrators, operators, vendors and customers.
- 3 Hours
  - 1st Hour: Work with your team to identify candidates and a finalist for your initial Concept to Collection Central Constraint
  - 2nd Hour: Apply a "10 M" Cause & Effect Diagram (sometimes called a "Fishbone" diagram) to brainstorm causes and prioritize solutions for the Central Constraint identified in the first hour
  - 3rd Hour: Introduction to basic quality & process-improvement methods