

Everyday A3 Conversations: Practicing for Mastery

Eric Olsen

California Polytechnic State University

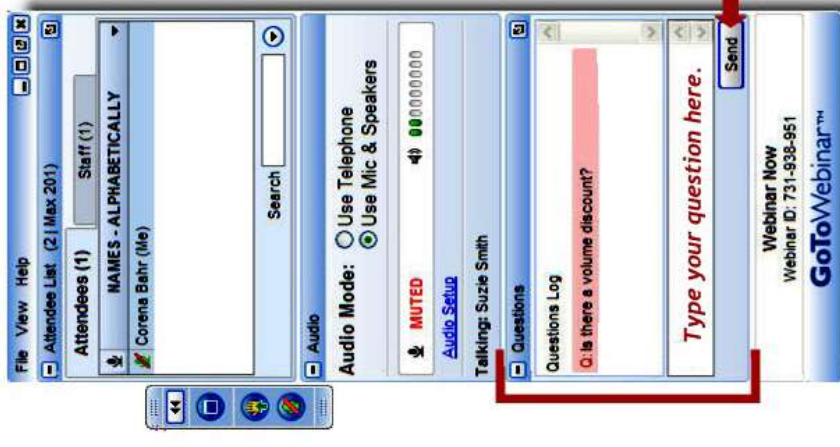
March 21, 2013



Agenda



- Welcome
- Introduction of MBB Webcast Series
 - Larry Goldman, MoreSteam.com
- Today's Session
 - Eric Olsen, Cal Poly
- Open Discussion and Questions



- Founded in 2000
- Trained nearly 400,000 Lean Six Sigma professionals
- Served over 2,000 corporate customers (including 50+% of the F500)
- First firm to offer the complete Black Belt curriculum online
- Courses reviewed and approved by ASQ and PMI
- Academic Partnerships with Ohio State University, Cal Poly and George Washington University

Select Customers:



Today's Presenter



Eric Olsen

*Assoc. Professor, Orfalea College of Business
at California Polytechnic State University*

- *Teaches in the undergraduate and master's programs emphasizing courses in lean thinking, six sigma, and operations*
- *Over 20 years of industry experience in engineering and manufacturing management*
- *MA/PhD Operations Management – The Ohio State University*

Title: Everyday A3 Conversations - Practicing For Mastery

I. Background

Develop people who practice, lead, and teach critical thinking!

- ✓ "Toyota sets up all its operations as experiments and teaches the **scientific method** to its workers."
(DNA of the Toyota Production System, Spear & Bowen, 1999)
- ✓ "Principle 9: Grow leaders who thoroughly **understand the work, live the philosophy, and teach it** to others."
(The Toyota Way, Liker, 2004)
- ✓ While the basic **A3 thinking follows a common logic**, the precise **format and wording are flexible**, and most organizations **tweak the design to fit their unique requirements**.
(Managing to Learn, Shook, 2008)

II. Current Conditions

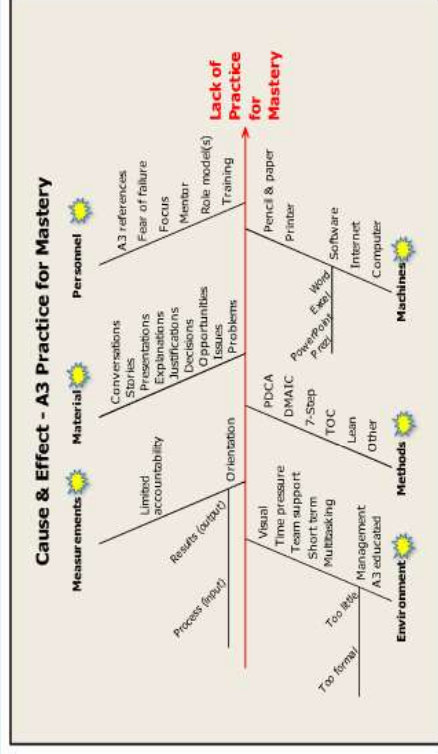
1. Companies **swim in a sea of problems** - *fish see water last*.
2. A3 thinking is being recognized as a major active ingredient in the **"secret sauce"** of lean six sigma.
3. **Engaging employees** in problem solving **"moves the needle"**.
4. A3 problem solving and DMAIC share a **common ancestry: PDCA**.
5. **Many people have been trained** and appreciate A3s, but **rarely do they gain traction beyond the classroom** or first experience.
6. **Even when supported by management**, ubiquitous A3 has a hard time gaining traction.
7. Everyone is tired of having the **same old conversations** and arguments **without clear conclusions or action plans**.
8. A3s are considered **formal, complex tools at are brought out only for special occasions**.

Problem Statement: **We do not get enough practice in A3 thinking for mastery.**

III. Goals/Targets

- Increase A3 practice from infrequent to frequent.
- Make A3 thinking pervasive in the organizational culture [KATA].
- Reduce perceived barriers to A3 use (e.g. "correctness", formality, and complexity).

IV. Analysis



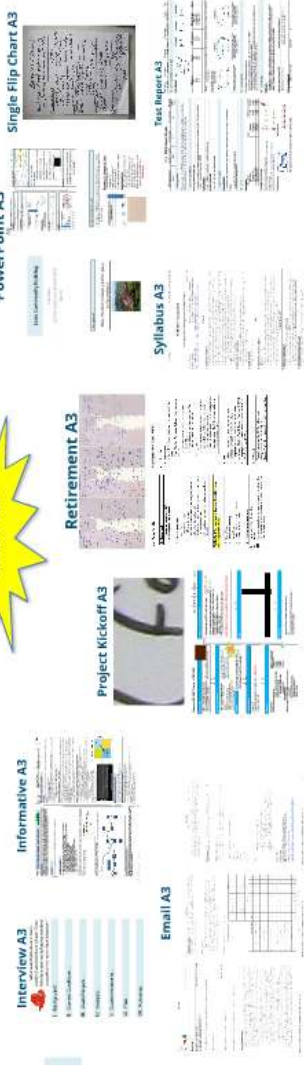
V. Proposed Countermeasures

"The 10,000 Hour Rule."

(Outliers, Gladwell, 2008)

1. **Look for excuses** to use an A3 approach
2. Consider the **20% A3**
3. Be an **A3 geek**

EXAMPLES



VI. Plan

1. Start small. Think **"small reversible experiments."**
2. Get a format you know well and feel comfortable with.
3. Just DO IT - **Be the change**.
4. Hold yourself accountable.
5. Get the first one done soon - *The crappy little first draft*.
6. **LEARN** - Pick yourself up and do it again.
7. Be easy on yourself - *Learning is a PROCESS*.
8. Ask for A3s from your co-workers - **Have conversations**.
9. Share - **go public**.

VII. Follow-up

Key Learnings based on my experienced on my experience:

- A3 thinking is an **analytical and creative process**.
- There is **no wrong or right way** to use A3 thinking - only experiences that we learn from.
- **You don't have to be an expert** to get the **80% value**.

Eric Olsen, PhD

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webpage: cob.calpoly.edu/faculty/eric-olsen/
Central Coast Lean - www.cob.calpoly.edu/centralcoastlean/

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IV. Analysis

A3 Mini Tutorial

Title: What are you talking about?

I. Background
Why are you talking about it?
II. Current Conditions
Where do things stand today? - Show visually using charts, graphs, drawings, maps, etc.
What is the problem?
III. Goals/Targets
What specific outcomes are required?
IV. Analysis
What is the root cause(s) of the problem? - Choose the simplest problem-analysis tool that clearly shows the cause-and-effect relationship.

Owner/Date
V. Proposed Counter Measures
What is your proposal to reach the future state, the target condition? How will your recommended countermeasures affect the root cause to achieve the target?
VI. Plan
What activities will be required for implementation and who will be responsible for what and when? What are the indicators of performance or progress?
VII. Followup
What issues can be anticipated? - Ensure ongoing PDCA. - Capture and share learning.

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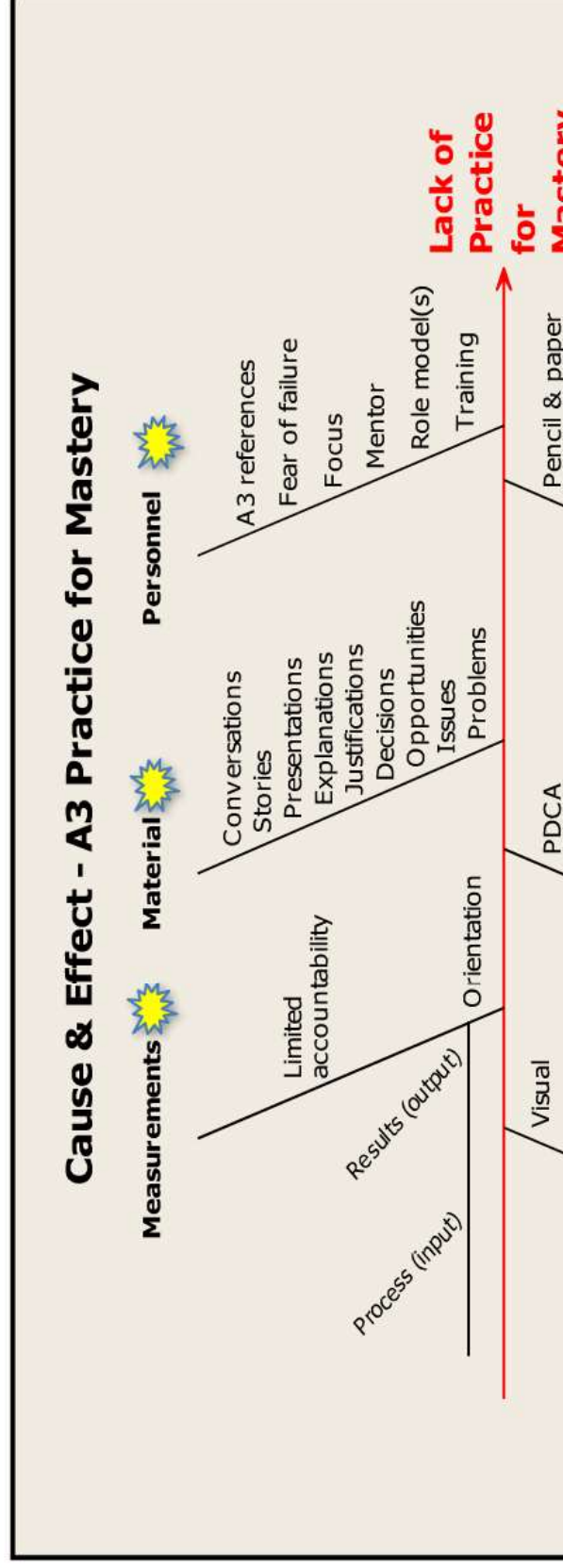
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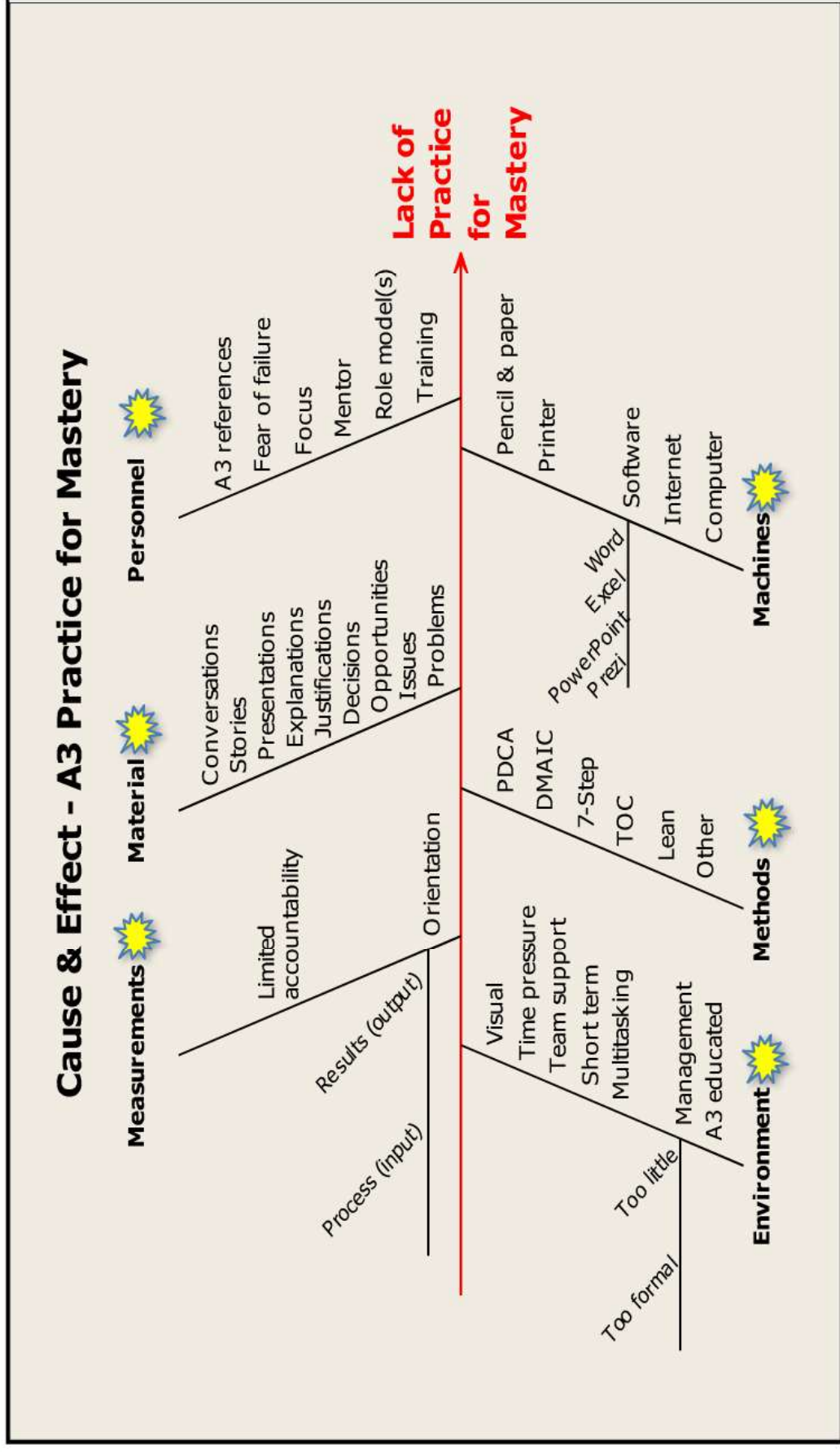
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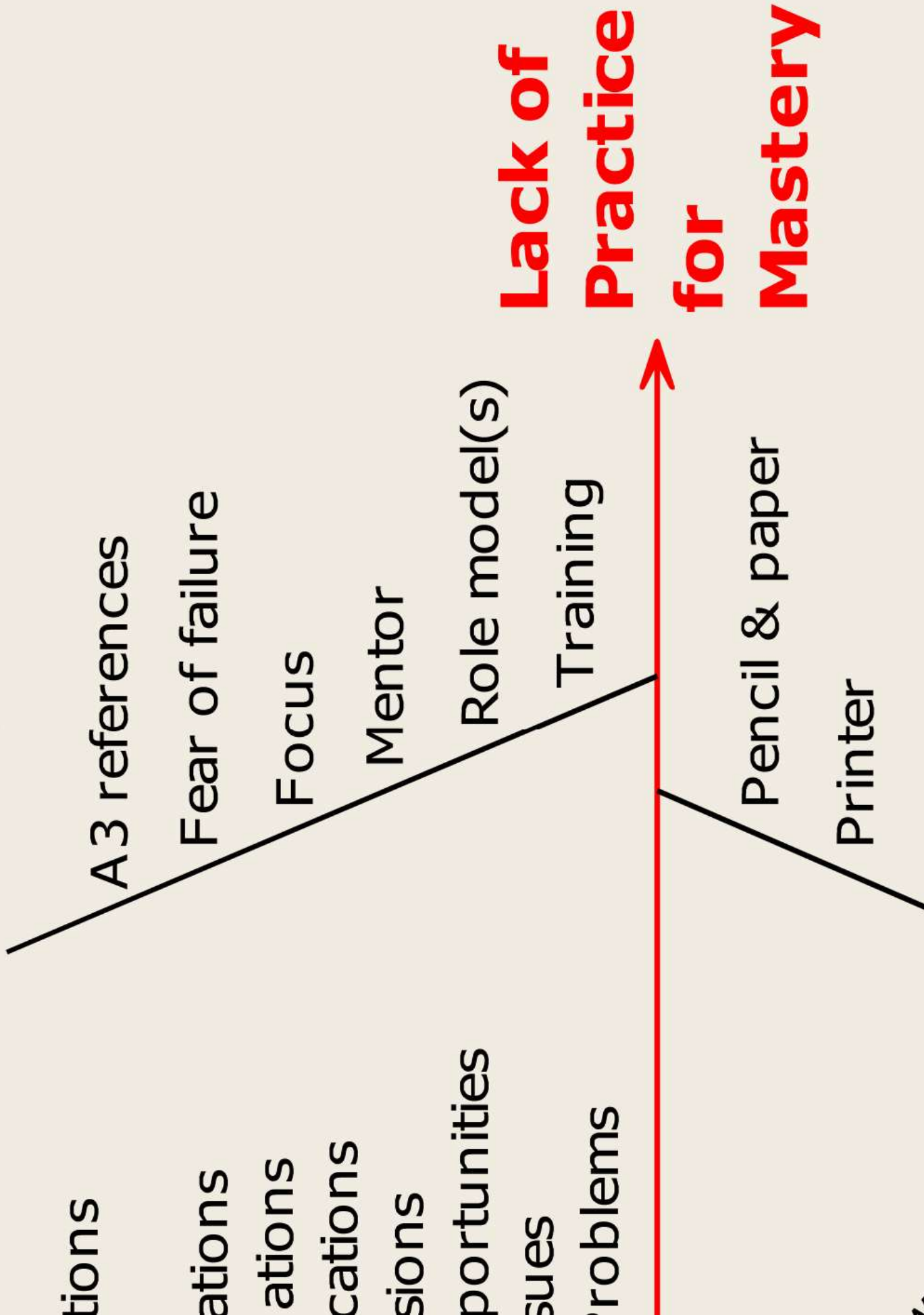


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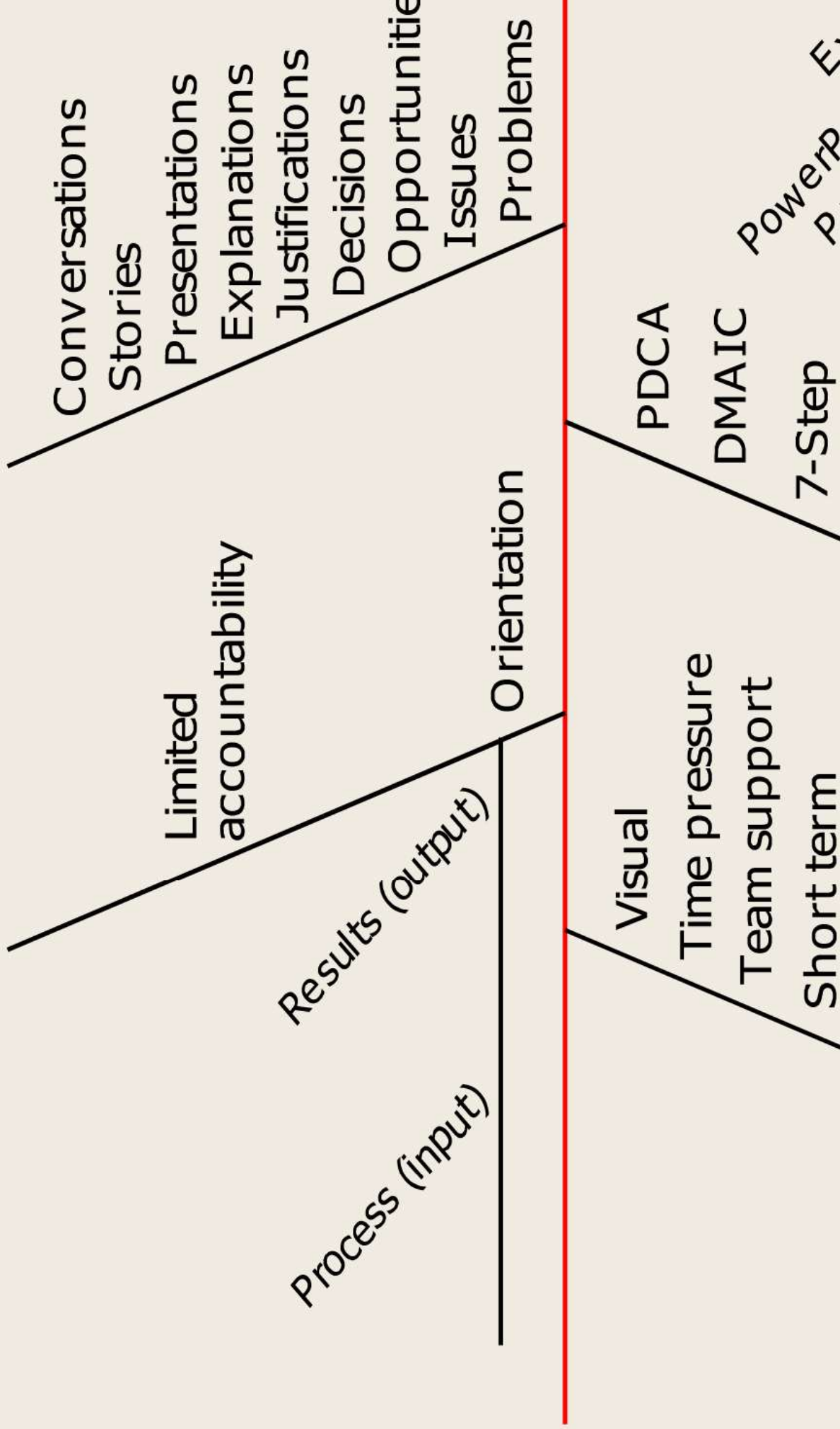
Personnel

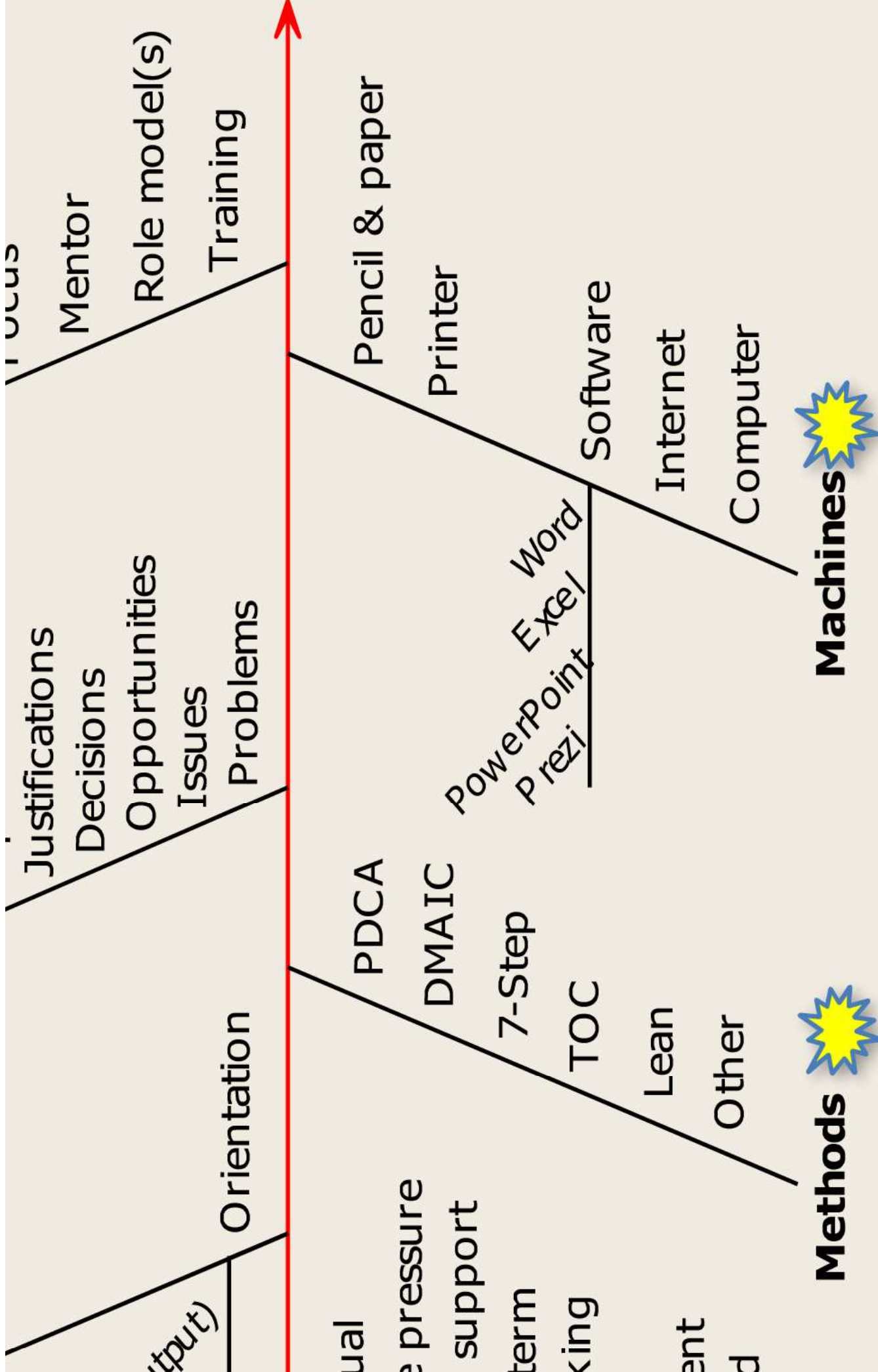


Cause & Effect - A3 Practice

Measurements 

Material 





input)

output)

Orientation

Visual

Time pressure

Team support

Short term

Multitasking

Too formal

Too little

Management

A3 educated

Environment



Methods



Lean

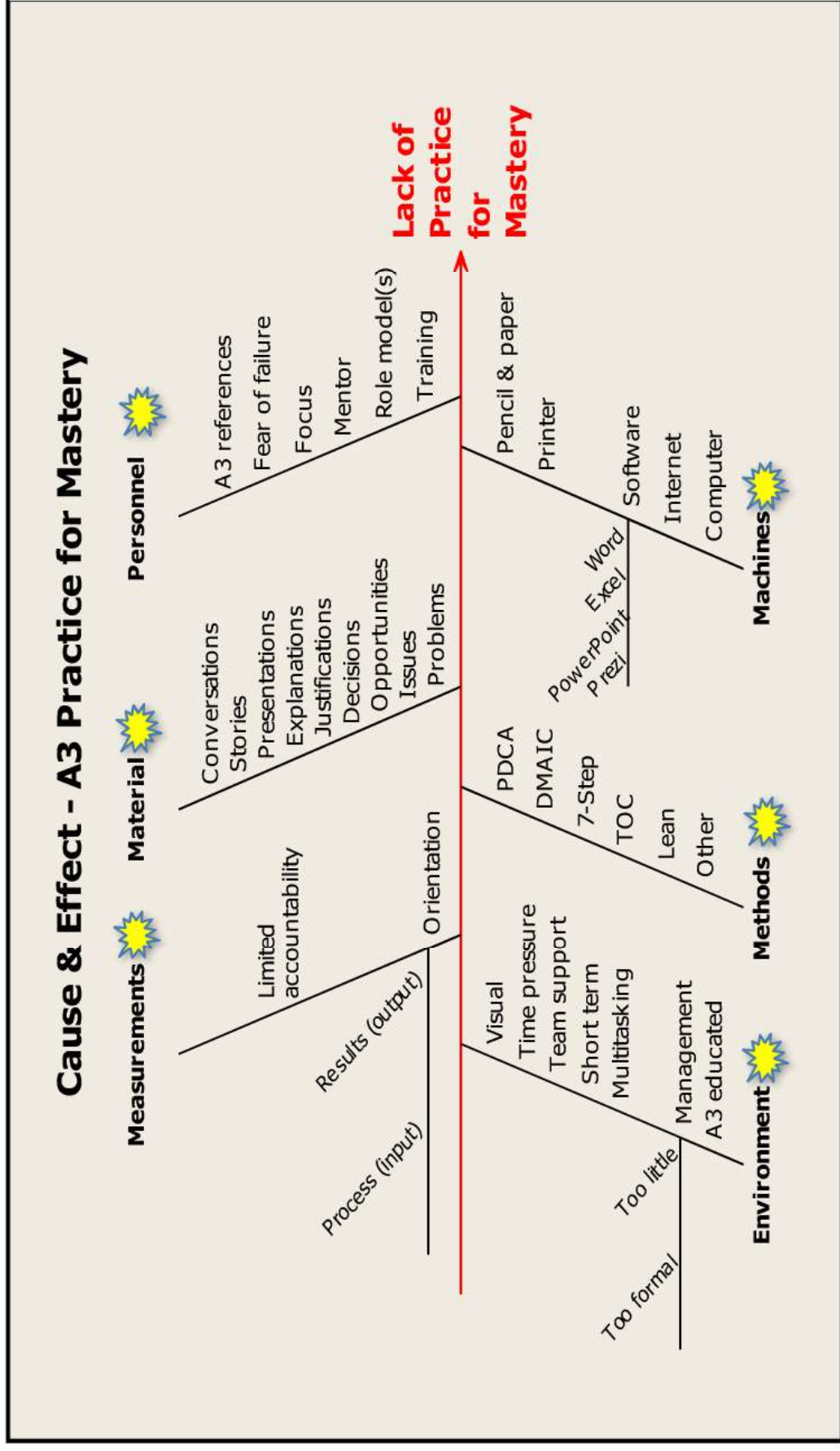
Other

7-

TO

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IV. Analysis



V. Proposed Countermeasures

"The 10,000 Hour Rule."

(Outliers, Gladwell, 2008)

1. **Look for excuses** to use an A3 approach
2. Consider the **20% A3**
3. Be an **A3 geek**

EXAMPLES

DILBERT

STUDIES SHOW IT TAKES TEN THOUSAND HOURS OF PRACTICE TO BE GREAT AT ANYTHING.

I WOULD THINK A WILLINGNESS TO PRACTICE THE SAME THING FOR TEN THOUSAND HOURS IS A MENTAL DISORDER.

THAT MAKES ME FEEL BETTER ABOUT MY MEDIOCRITY.

YOU'RE WELCOME.

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Dilbert.com | DilbertCartoonist@gmail.com

PowerPoint A3

[illegible]

Informative A3

Interview A3

What would you do if a team of scientists told you that the monkeys were not planning standard procedures in a hierarchical manner?

- Background...
- Current Conditions...
- Goals/Targets...
- Analysis...
- Countermeasures...
- Plan...

Retirement A3

[illegible]

Project Kickoff A3

The image displays a document layout. On the left is a large rectangular area filled with a dense, chaotic pattern of blue and black marks, resembling a heavily redacted or heavily marked-up document. To the right of this area is a vertical column of blue and white rectangular blocks. The top block contains a small image of a person's face. Below it are several blocks of text, some of which are partially obscured by a large, stylized yellow and orange graphic. The bottom block contains a small image of a person's face. The entire image is framed by a thick black border.

Email A3

Syllabus A3

[illegible]

Test Report A3

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VI. Plan

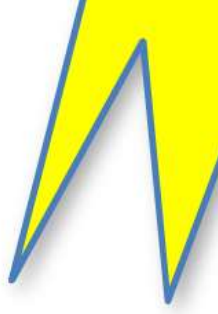
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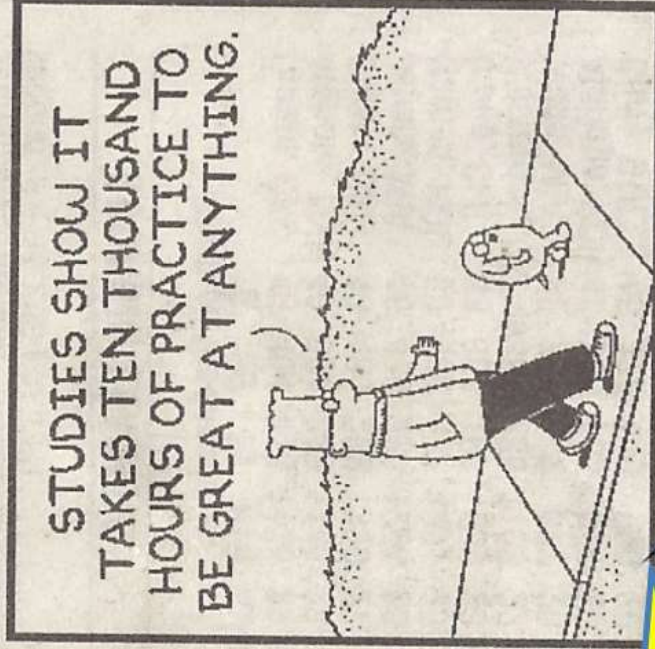
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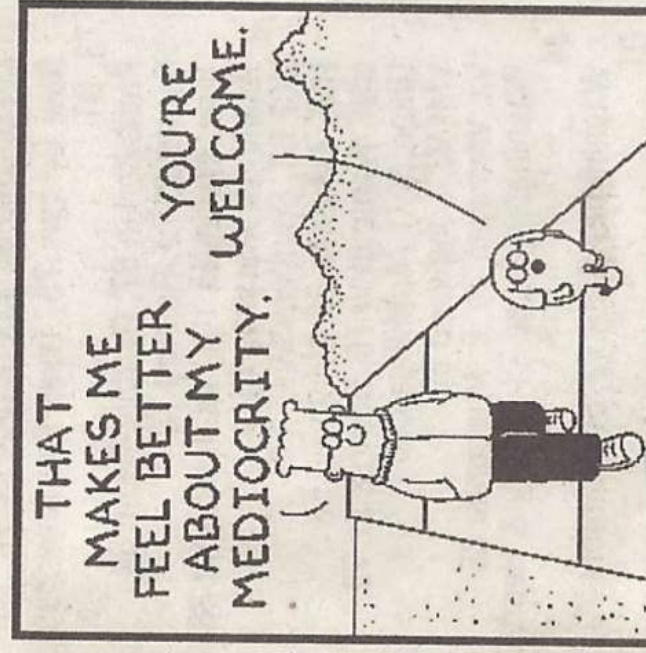
DILBERT



Dilbert.com DilbertCartoonist@gmail.com



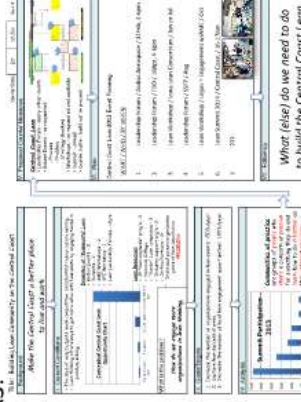
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SCOTT ADAMS

PowerPoint A3

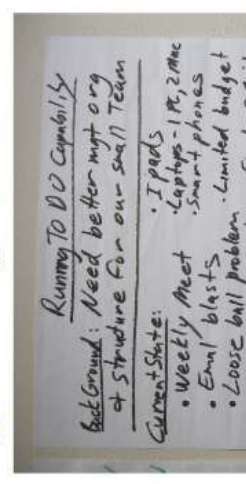
A3:



Lean Community Building

Eric Olsen
Central Coast Lean Summit 2013
4Jan13

Single Flip Chart A



Jan 7

EXAMPLES

[illegible][illegible]

Project Kickoff A3

Background

- MET/Cal Poly building Relationship
- Need for Water Mgt Masters Knowledge - MET & World
- DVL → End Goal/Vision • Need for generic PM Course at Cal Poly - GSB5XX

Current Conditions

- Eric & Jim working PM Module
- Doc - CRP 570 Course Coord (7/5/12)
- Exemplar module - Multiple department approval
- CRP 570 → Special Topic allows avoid course approval
- Lots riding on DVL for MET (Mgt Support)
- GSB5XX - currently on books
- MET claims significant demand
- Expenses covered (Travel)

Cal State
LA - Meet
1 Aug

Problem

- Design course w/ eye to Future Fall Course
- Integration??
- Module in CRP570
- GSB5XX
- Grad certificate

Goals/Targets

- Fall 2012
- Learning outcomes for each day
- Great first effort
- * Modular??

Analysis

- Course Structure Req.
- Water Content early + later
- Thru need for Students
- Diamond Valley Lake
- Concept Model
- what it means to know what you need to know
- Constraints
- Org, Mgt + Design
- Mgt Factor Project - Opportunities

Course A3: MET Intro Course CRP570

Eric O, Jim S, Brian T, Chris C 7/5/12

Proposed Countermeasures

- Matched pairs of MET & Cal Poly Faculty
- Chris Coordinator - Every meet [Working Lunch]
- Thurs Dinner 5-8pm, Friday 8-2:30pm (Train)
- Alternate Union Station vs Diamond Valley
- 6 modules + Field Trip

Plan

- What works at MET? (Not)
- What works best? Intro complexity of what you don't know (Teaser)
- Detailed module outline/minutes
- Who All
- By When Friday Before 30 Jul
- Module Overview (Exemplar) for Syll A11
- Arrange Meet w/ MET Expert [Earlier] Chris week 6 Aug
- Familiarity w/ DVL ? Chris via MET
- Check existing PM - differentiate
- Green light GSB5XX
- Course materials provided
- Quote El Corral
- MET Course Announcement - Formal
- Pat Stoneman 15000 contracts
- Module
- Full Course

Follow-up

- Contract / Hybrid ISSUE
- IP
- Contextualize GSB5XX in other prag??
- Audience limitations

Future? → Sustainable

Workload People Logistics Admin \$\$\$

Course A3: MET Intro - CRP 570



Background

- MET/ Cal Poly building relationship
- Need for Water Management Masters' • DVL --> End Goal/ Vision
- Need for generic PM course at Cal Poly knowledge @ MET & **WORLD!**

Current Conditions

- Eric and Jim working PM Module
- Doc → CRP 570 Course Coord. (7/5/12)
- Exemplar module provided
- CRP 570 -- special topic allows to avoid course approval [Multiple depart policies on course approval!]
- Lots riding in DVL for MET (Mgt Support)
- GSB 525 - Currently on books
- MET claims significant demand
- Expenses covered (travel)



Problem

1. Design course w/eye to future full course: Module in CRP 570 -- GSB 5XX -- Grad Certificate
2. Use integrated approach to curriculum.

Target/Goal(s)

- Fall 2012
- Learning outcomes for each day --> **Modular???**
- Great first effort

Analysis

Integration2

Course structure required

- Water content early and later
- Thread for students
 - Diamond Valley Lake development
- Concept Model

- What it means to know what you need to know*
- Constraints
 - Mgt of activity or project
 - Org Mgt and design
 - Opportunities

Future?--> Sustainable

- Work load
- People
- Logistics
- Admin
- Money

Proposed Countermeasure(s)

- Matched pairs of MET & Cal Poly Faculty → •What (didn't) worked at MET?
- Chris coordinator & every meet (working lunch) •What works best?
- Meeting Format/Logistics: Thurs dinner 5-8pm, Fri 8-2:30pm (train 3:00pm)
- Alternate Union Station vs. Diamond Valley
- 6 Modules + field trip
- PM module to mirror the course concept model

Overall Objective: Intro to complexity - What you don't know [teaser].

Plan

What?	Who?	By When?
1 Detailed module outline materials	All	Friday before class meeting
2 Readings Specified		
3 Module overview per exemplar for syllabus	All	30-Jul week 6Aug
4 Arrange meet w/MET expert (dating concept)	Chris	
5 Provide familiarity with DVL	Chris via MET	
6 Check existing GSB525 PM course - differentiation	Jim	13-Jul
7 "Green Light"	Brian	2-Aug
8 Issue instructor contracts	Pat Stoneman	
9 - Module		
10 - Full course		
11 Course materials provided to Chris	Eric & Jim	Monday before class meeting
12 Quote support from El Correl	Chris	

Followup

- Contact hours / hybrid approval issue
- IP
- Contextualize GSB 5XX in other programs??
- Audience limitations

Informative A3

ENTITY 06	2013 Central Coast Lean Summit				VP	Tony Guy	Tony Guy	WFO	Bryan Davenport	Owner: Bryan Davenport	Date: 1/16/2013	Approval Date: 1/16/2013	 ZODIAC AEROSPACE Huntington Beach, CA 92648

Background

Eric Olsen, a professor at Cal Poly San Luis Obispo has now put on the Central Coast Lean Summit twice. This years Summit was held on 1/4/2013. It provides a forum for local and a few out of the area business the chance to mingle and learn from one another on all topics "lean," business sectors and academic institutions represented at the conference included: hospital care, several manufacturers and consultants, SLO and Ventura County government, Ohio State University, and Cal Poly

Attendees

Bryan Davenport, Irene Gonzalez, Aaron Buckley, Michael Conley, and Josh Parra

Activities Realized

The Summit was comprised of lectures, some of which had team activities. The topics included:

- "White Collar Lean: Kaizen Events for the Office" by Mike Osterling
- "How to Solve a System Problem: An Introduction to Cause Mapping" by Peg Pennington
- "Speed Kills... especially if too slow!" by Luke Faulstich
- "Customer Focused Culture at SSF" by Steven Kane
- "Benefits of Electronic Kanban" by Nicole Smith
- "Set-up Reduction for Printers" by Malcolm Keif
- "Lean Healthcare: Culture Matters" by John Ruffner
- "Lean Government: It's all in Your Head" by Elaine Crandell
- "Lean Community Building" by Eric Olsen

A3 Posters

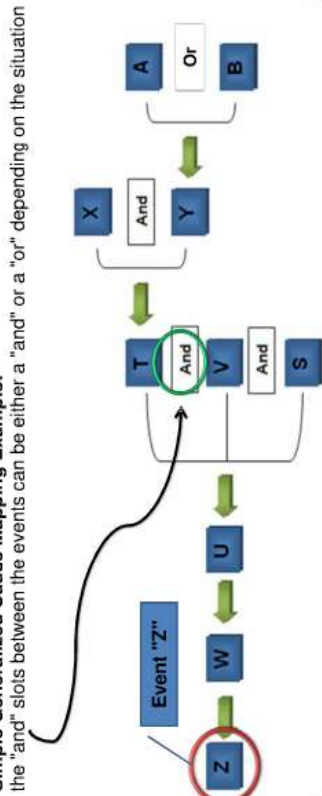
Several business and Cal Poly students posted posters in an A3 format which were available for viewing throughout the event.

Examples From "Cause Mapping" the activity :

Transitive Property:



Simple Generalized Cause Mapping Example:



Expectations compared to actual

Overall the group that attended the conference felt it met our expectations and was a worth while use of our time. The summit followed its agenda very closely, and the information obtained matched the conference's schedule descriptions. It would be worth while to attend the Lean Summit in 2014.

Key Points and Lessons Learned

The Lean Office

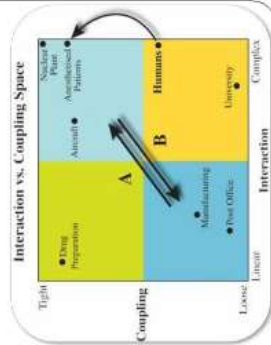
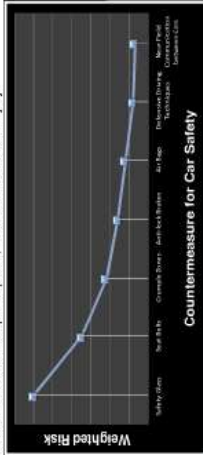
- Most lean office projects have their focus in the wrong place. They focus on the "value" added activities instead of the "non-value" added activities.
- It is hard to relate the 7 wastes to office activities
- The 8th waste is: **Underutilized People**
 - examples: generating paper work before it is needed, increasing variation by batching documents, working on documents that are not needed while the ones that are required sit idle,
 - Kaizen workshops
 - Should have 4 to 6 weeks of pre-study to fully understand the issues
 - Should **NOT** have any open items at the end of the event

A lesson to learn from a transformer MFG: "Power Partners"

- After hurricane Sandy hit the gulf coast in 2012, Power Partners was able to deliver finished products to the affected areas before the current supplier could.
 - In order for this to occur they had to create and finish all of the required engineering and documents, set up their production line, produce, and deliver faster than their competitors could.
- They were able to do this due to them taking the time up-front by identify potential customers and working with them to understand their requirements and specifications.
- Although they were not currently the supplier to the areas they were able to help the communities by being a part of getting the power on faster than they could.
- Due to their success they were able to win contracts in new areas becoming the main supplier due to their extremely short lead times compared to the industry standard
- They are able to reduce their lead times by building "better" relationships with their customers and suppliers. "They don't sit on it," meaning they are proactive and go out of their way to be better.

Thinking of a Problem as a System: Using Cause Mapping to identify all of the key points

- The basis of Piche's map can be linked to C. Piche's "Normal Accident" Theory.
- The 2X2 map below, "Interaction vs. Coupling Space" is a pictorial representation of this theory, see below.
- She asked that as a system becomes more complex the more important it is to use lean tools.
- She also noted we should think of root "causes" not a root cause.
- Cause mapping can be used to detail all of the possible "causes" that occurred for the problem to be noticed.
- When starting a cause map identify the following corporate goals impacted: Safety, Quality, Cost, Delivery, and Moral/Management
- What's **NOT** a cause (things not to end on in the map)
 - Human error
 - Training inadequacies
 - Equipment Failure
 - Procedure not followed
 - Poor communication
- Systems Thinking and understanding all of the potential "causes" can be used to reduce risks; see the Countermeasure for Car Safety example below.
- As each countermeasure is put in place; it reduces the risk of injury.



Weak points of the presentations

- We found it was hard to learn in a presentation only setting.
- It was not clearly outlined that it take a team to construct a "proper" cause map
- Perception of most of the items presented were easier said than done

Improvements identified we could use

- We felt we could benefit by incorporating the following items or ideas into our BU:
 - Cultural shift - all employees need to have a sense of ownership of the company
 - This fits in well with our "lean transformation" and will take time
- The problem solving tool - Cause Mapping
 - We deal with many variables that all need to be considered to find a set of solutions for complex problems.
 - Using data to solve problems, minimize risk, and to measure all aspects of an item
 - Having a vision with goals and targets
 - We need to do a better job at risk reduction and identification
 - Taking time up front to understand potential customers → PSU

Interview A3



What would you do as a Team Leader if you found one of your Team Members was not following standard procedure in a non-critical situation?

I. Background...

II. Current Conditions...

III. Goals/Targets...

IV. Analysis...

V. Countermeasures...

VI. Plan...

VII. Follow-up...

Overall the group that attended the conference felt it met followed its agenda very closely, and the information obtained while to attend the Lean Summit in 2014.

2004



Classical - Books & Art

Questi i risultati di *Form2 A4*

Email A3

Eric Olsen <erolsen@calpoly.edu>
To: Larry Goldman <larrygoldman@monrteam.com>
Cc: Ellen Milnes <emilnes@monrteam.com>

Sun, Mar 10, 2013 at 4:29 PM

Conclusion: Software is the element of a potential system that provides the greatest potential for "rethinking" an approach to A3 problem solving. A3 process skill should not be a significant factor in designing an effective approach.

Future State: A user-friendly A3 process that allows businesses to more readily adopt A3 problem solving and access the full range of its benefits.

Proposed Countermeasures:

Consider the following software platform or combination of software technologies as the starting point for countermeasure development:

2. Microsoft Office 361120 110808M11

1. The use of A3s and the A3 problem solving process is becoming increasingly popular as companies progress on their lean journeys.
2. Experts agree that a high value outcome of the application of the A3 process is the thinking and problem solving skills that it builds in associates.
3. A3s are developed at Toyota when computers and large format electronic printing was not ubiquitous.
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5. A3 size paper allows a problem, analysis, and plan to be captured on a single sheet of paper.
6. Pencil and eraser allow the A3 to be readily updated as the A3 owner builds his or her understanding of the problem and countermeasures.
7. Learners new to the A3 process find the large paper hard to work with.
8. Reproduction to share with colleagues is often inconvenient. Copiers with 11x17" capability are required or two-piece or taped reproductions are used.
9. Desktop scanners don't usually accommodate 11x17" formats.
10. To capture learning for future access, and to share with large audiences via slide presentation, A3s are often converted into electronic form.
11. Replacing a comfort with computers and electronic communication that could in effect replace the comfort previously attributed to pencil and eraser.
12. The current work environment often requires distributed teams to collaborate. Problems, asking paper and pencil enabled processes less practical.

1

5

1

System Design Matrix												
ID	Customer Needs	System Requirements										New A
		A	B	C	D	E	F	G	H	I		
1	Ability to supply feedback	10	9	1	5	9	9	3	1	3	3	3
2	Remote collaboration	9	9	3	5	9	9	3	3	3	3	3
3	Uses common hardware	9	0	1	1	8	3	9	9	9	9	9
4	Easy to change	8	1	9	9	1	9	3	3	3	3	3
5	Electronic storage and retrieval	8	0	9	1	3	9	0	3	0	3	0
6	Space restricted (library)	7	3	3	9	1	3	9	9	9	9	9
7	Uses common software	7	0	3	3	1	9	1	3	0	3	0
8	Allows use of common problem solving tools	5	1	3	9	1	9	1	9	1	9	9
9	Requires common alternative	5	3	3	5	1	9	3	5	1	9	3
Weighted Score		230	282	434	316	416	360	315	416	360	315	416

Interpretation: Higher relative scores for columns indicate higher

Plan

Background: Developing problem-solving skill in the workforce.

Current Conditions:

1. The use of A3s and the A3 problem solving process is becoming increasingly popular as companies progress on their lean journeys.
2. Experts agree that a high value outcome of the application of the A3 process is the thinking and problem solving skills that it builds in associates.
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 - a. Reproduction to share with colleagues is often inconvenient. Copiers with 11x17" capability are required or two-piece or taped reproductions are used.
 - b. Desktop scanners don't usually accommodate 11x17" formats.
 - c. To capture learning for future access, and to share with large audiences via slide presentation, A3s are often converted into electronic form.
6. People have a comfort with computers and electronic communication that could in effect replace the comfort previously attributed to pencil and eraser.
7. The current work environment often requires distributed teams to collaborate on problems, making paper and pencil enabled processes less practical.

Retirement A3

Dawn's (Retiree) LIFE
A3 Conversation - Problem Solving Tool

[Background]
- Why talk?
- Connection to higher goals or strategies.
Inherent Quality of Life

[Current Situation]
No sure work plan
• 60 in Feb 13
• 2 hr drive per day
• 9th day
• Husband/academic school out-of-sync.
• Adequate for retirement.
• Newly married out on vacation.
• Daughter & family in diff parts country.
• Operations - all consuming.
• Floated Retiree - Regim. buying in past.
[Problem] - GAP? Need more time & flexibility to do what's important to me.

[Goals & Targets]
More time w/ family
More flexibility
Some income - consistent w/ contribution
Career - Do what I love

[Consider Measures (Solutions)]
reorganize → Retiree-up suck it up. (Live with the Gap)
Retiree
Dawn will emphasize Retiree's Mgt.
structured to time & flex.

[Analysis]
Pros
• Challenges
• People
• The Gap!!!
• Flex
• No want lose.
• Good at (Expire)
• Want of people (Expire)
• Some interesting challenges.
• Addresses succession partially.

[Chg?]
Cons
• THE GAP!!!
• Challenges that are structured to time & flex.
• Limited
• Challenges named
• Unknown
• No people to work with.

[Plan]
What
① Call Dawn - Intro Issue w/ A3
② Dawn thinks about it
③ Feed back conversation

[Who]
Dawn
David
Dawn & David

[By When]
1/25/13
1/25-29/13
1/29/13

[Plan Cont'd]
④ If "Explore" make
A. Explore
B. Report Findings
⑤ If No Explore or Explore
A. Announce Retiree
B. Retiree

[Follow-up]
• Yosemite Vacation 20-27 July 13 unless
• Family Reunion 29 Jun - 7 July 13
• Clean-up Eric's life - Align w/ Dawn's new direction.

[Who]
Christina
Dawn
Dawn

[By When]
2/12/13
2/12/13
2/19/13
4/12/13

Title: Dawn's Life

Owner/Date: Dawn Olsen 1/25/13

1. Background

V. Analysis
a. Status Quo

Title: Dawn's Life

Owner/Date: Dawn Olsen 1/25/13

1. Background
1. Increased Quality of Life 2. Realization life is short
2. Current Conditions
• 60 in Feb 13 • 2 hour drive per day • 9 - 10 hour day at work • Husband academic schedule out of sync with mine • Adequate \$ for retirement • Daughters and family in different parts of the country • Time-off hard to take • GM operational responsibility- all consuming; lacks flexibility

PROBLEM GAP: Need more time and flexibility to do what's important to me.

3. Goals/Targets
• More time with family • More flexibility • Income consistent with contribution • Career: Do What I Love
4. Proposed Countermeasures
I. Live with the Gap- Status Quo II. Retire III. New Role emphasizing Regional Buying structured for time and flexibility. ie. Partially work from home, no operational role, "Do What I Love"

V. Analysis
a. Status Quo
○ Pros: \$; Challenges; Continue to work with existing people ○ Cons: The Gap; Challenges that suck time , lose sleep • Retire
○ Pros: Gap mostly closed; lots of time and flexibility ○ Cons: \$ limited; challenges removed; The Unknown; no people to work with.
• Buying Role
○ Pros: Do What I Love and good at; Work with people; \$; Some "interesting" challenges; addresses succession partially ○ Cons: No current model; need to invent position; time consuming; ARAMARK infrastructure not necessarily supportive.

5. Plan

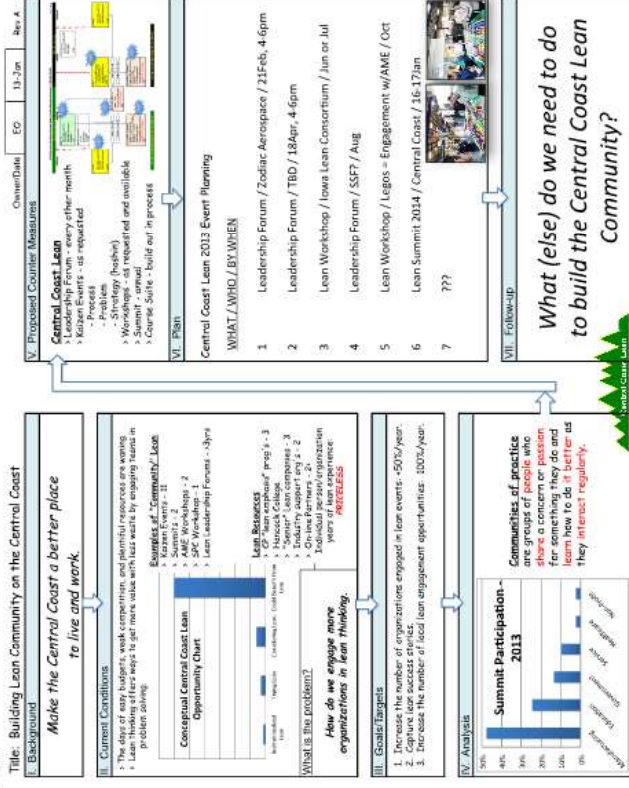
- Call David by 1/25/13. Discuss. No decision
- Feedback conversation week of 1/28/13
- If Buying Role viable determine structure and particulars. Chris & David? Report Findings. 2/12/13
- If Buying Role not viable Dawn announce retirement 2/19/13. Retire 4/17/13.

6. Follow-up

Yosemite vacation 20-27 July 13 (or less)
Family reunion 29 Jun- 7 July 13
Cleanup Eric's life - Align with Dawn's new direction.

PowerPoint A3

A3:



1

Lean Community Building

Eric Olsen

Central Coast Lean Summit 2013

4Jan13



I. Background

Make the Central Coast a better place to live and work.



3

II. Current Conditions

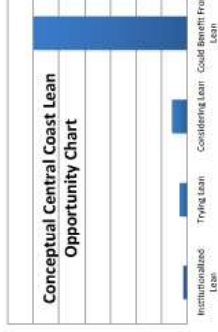
- > The days of easy budgets, weak competition, and plentiful resources are waning.
- > Lean thinking offers ways to get more value with less waste by engaging teams in problem solving.

Examples of "Community" Lean

- > Kaizen Events - 11
- > Summits - 2
- > AME Workshops - 2
- > SPC Workshop - 1
- > Lean Leadership Forums - >3yrs

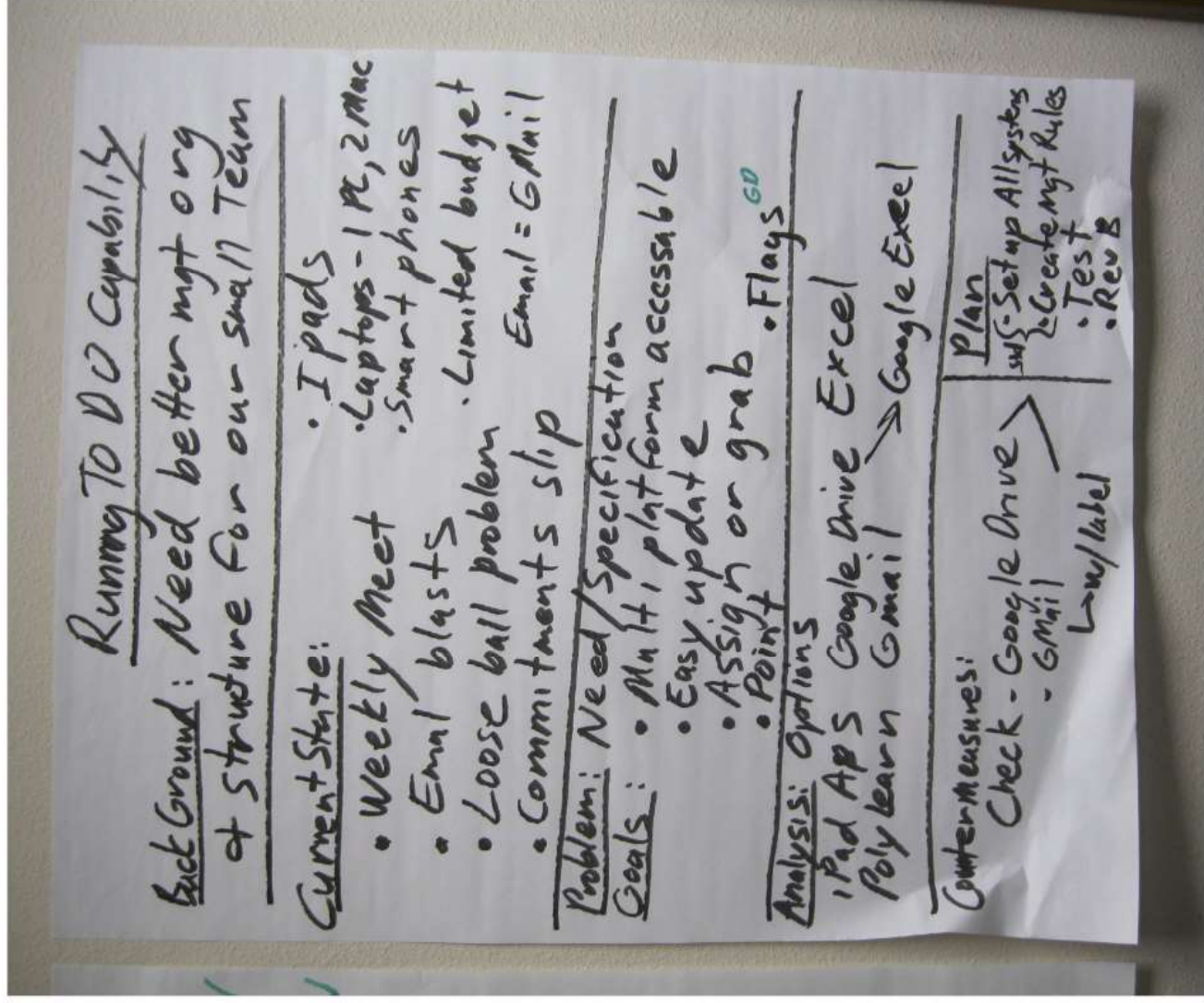
Lean Resources

- > CP "lean emphasis" prog's - 3
 - > Hancock College
 - > "Senior" Lean companies - 3
 - > Industry support org's - 2
 - > On-line Partners - 2+
- Individual person/organization years of lean experience: **PRICELESS**



2

Single Flip Chart A3



Test Report A3

Title: **PW X Beam Modal**

Part Description:		Engine Program	Part Number	Part Identifier	Material
Beam		PW X	12345	sn 2	stainless steel

I. Background

This test is part of the **PW X** program which has the **overall goal** to qualify the test benches. Specific goals related to this test include: vibration verification and screening.

II. Current Conditions

Reason for Performing this Test:

Correlate measured frequency response to prediction from analytical model. Validate analytical model. Frequency range up to 1000Hz.

Part Description

Beam. Supplier: Imaginarium. Development hardware

Previous Test Results:

See AML 12-7123 for previous results.

III. Goals/Targets

Expected Results

Frequency and mode shapes of the first three fundamental modes: 1st, 2nd, & 3rd bending

Targets:

Frequency with 5% of analytical predictions
Mode shapes visually similar

IV. Plan

Test Schedule

ITEM	WHAT	WHO	EXPECTED	COMPLETE
1	Test Plan	Engineer	2/5/2013	2/8/2013
2	Conduct Test	Technician	10-Feb	20-Feb
3	Data Processing	Engineer	22-Feb	22-Feb
4	Review Results	Customer	23-Feb	23-Feb

Test Equipment and Setup

Modal: roving hammer with 1 accelerometer
Boundary Condition: Clamped to table at one end, free at the other -
Simulate fixed-free
Excitation: small modal hammer, 5 impact locations evenly spaced
Measure response: uniax accel at tip of free end

Test Photographs



Test Geometry

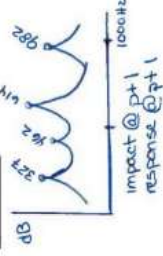


This document contains no technical data subject to the EAR or ITAR.

AML Job #	Customer	Engineer	Technician	Date	Rev
13-7000	Eric Olsen	Kaitlin Olsen	Joe Wrench	3/3/2013	D

V. Data Collection & Analysis

Data Collected:



1st Bending

2nd Bending

3rd Bending

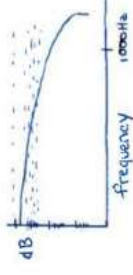


Measure	Target	% Difference	Mode Shape	Note
327	300	9.0%	1st Bending	1
462	450	2.7%	2nd Bending	1
614	600	2.3%	3rd Bending	1

Notes: 1. Mode shape compare visually to predictions. Mode shapes are consistent with predicted mode shapes.

Data Quality Indicators

Input Spectrum



Coherence



Reciprocity



The frequency spectrum of the hammer input indicates ample excitation up to 900Hz.

Coherence is good (near or equal to 1) for the first three peaks. For the 4th peak the coherence drops at the peak indicating a problem with the data.

Model assumes a linear system. In a linear system the FRFs of two reciprocity measurements should overlay. The PW X Beam is a linear system.

VI. Conclusions

Conclusion/Recommendations:

Measured the frequency response of the PW X Beam up to 1000Hz. 1st bending was higher than 5% analytical prediction. Test conducted according to AML guidelines. Data quality indicators show the data collected was good for the first three modes and the system is linear.

VII. Follow-up

Reflections:

Clamping beam to table may not have the same boundary condition as the analytical model. If the analytical model boundary condition are based on the final bench test configuration there may be differences in the results. Frequency response is sensitive to differences in boundary conditions.

Improvements for Future (AML):

Different fixturing to ground fixed end

Improvements for Future (Customer):

Adjust analytical model to align with actual test boundary condition instead of bench boundary conditions.

Review and Approvals:

Subject Matter Expert

Supervisor

Syllabus A3

Eric Olsen

Cal Poly - Orfalea College of Business

GSB 534 - Spring 2012

Lean Operations Management – Graduate Course

Mar12 Rev S

Dr. Eric Olsen
Bldg 03 Rm 435
Office: 805 756-1754
Email: ecolsen@calpoly.edu

Assistant Professor of Industrial Technology
Office Hours: W/Th 1:30-2:30pm or appointment
Course Web Address: see PolyLearn
Website: <http://www.cob.calpoly.edu/faculty/eric-olsen/>

PLAN

1. Grasp the situation

- Operations, along with marketing and finance, is a fundamental function to any business.
- In a general sense, operations are simply processes that transform inputs to outputs.
- In most companies, operations has the majority of employees.
- In the US, the service business sector is growing (+85%) and manufacturing is shrinking.
- Outsourcing of operations to low cost regions is a fact of business.
- Lean thinking, as a set of principles and tools has been both popular and successful in improving the performance of many different types of operations.
- MBA students need a good set of basic principles and tools with which to address operations management decisions in a variety of industries.

2. Select the best alternative

- Teach lean thinking to MBAs in a variety of operations contexts.
- Focus on a few key tools, like value stream mapping and A3 problems solving, to build and retain skill in lean thinking.

3. Build the plan

- See course outline.

DO

4. Implement, monitor, adjust

Responsibilities:

- Instructor: Deliver lean operations content, facilitate class exercises and discussions, access student learning, and monitor and adjust the course as required.
- Students: Complete all assigned readings and exercises on time. Complete 5-minute presentation on lean topic. Add value to class activities. Contribute to team projects.
- Guest presenters: Add insight and richness to select topics.

CHECK & ACT

5. Measure and analyze

- Individual quizzes: 20% each - **60% total**
- Individual class participation: **10%** including in class discussion, attendance, pop quizzes, discussion board postings, and occasional individual or team assignments.
- Team project and presentation: **30% total (10% present, 20% written mat'l)**

6. Learn and continue the cycle

- Individual and class reflections will be collected during the last session.
- Well-considered ideas for improvements to learning content and method will be accepted throughout the class.

V. Proposed Countermeasures

"The 10,000 Hour Rule."

(Outliers, Gladwell, 2008)

1. **Look for excuses** to use an A3 approach
2. Consider the **20% A3**
3. Be an **A3 geek**

EXAMPLES

Interview A3

When would you like a 30 min. lesson if you have one of your items?

Let's say you have one of your items and you want to know how much more you can produce in a non-critical situation?

I. Background

II. Current Conditions

III. Goals/Targets

IV. Analysis

V. Countermeasures

VI. Plan

VII. Evaluation

Informative A3

1. **Background**

2. **Current Conditions**

3. **Goals/Targets**

4. **Analysis**

5. **Countermeasures**

6. **Plan**

7. **Evaluation**

8. **Conclusion**

9. **Summary**

10. **References**

11. **Appendix**

12. **Notes**

13. **Comments**

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Informative A3

Figure 1. The location of the study area in the north-east of Iran. The map shows the province of Gilan, with the city of Rasht and the location of the study area marked. The map also shows the surrounding provinces of Mazandaran and Alborz.

Email A3

[illegible]

Project Kickoff A3

A page from a manuscript, likely a historical record or account, featuring dense handwritten text in a single column. The script is a cursive, possibly from the 16th or 17th century. The paper is aged, showing significant discoloration and some staining, particularly along the left edge. The text is written in a dark ink, and the overall appearance is that of a well-preserved but old document.

[illegible]

Retirement A3

→ Don't forget	
1. Engagement	
2. Integration of the business	
3. Control	
4. Measurement	
5. Reporting	
6. Review	
7. Improvement	
8. Communication	
9. Documentation	
10. Monitoring	
11. Reporting	
12. Review	
13. Improvement	
14. Communication	
15. Documentation	
16. Monitoring	
17. Reporting	
18. Review	
19. Improvement	
20. Communication	
21. Documentation	
22. Monitoring	
23. Reporting	
24. Review	
25. Improvement	
26. Communication	
27. Documentation	
28. Monitoring	
29. Reporting	
30. Review	
31. Improvement	
32. Communication	
33. Documentation	
34. Monitoring	
35. Reporting	
36. Review	
37. Improvement	
38. Communication	
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149. Reporting	
150. Review	
151. Improvement	
152. Communication	
153. Documentation	
154. Monitoring	
155. Reporting	
156. Review	
157. Improvement	
158. Communication	
159. Documentation	
160. Monitoring	
161. Reporting	
162. Review	
163. Improvement	
164. Communication	
165. Documentation	

Syllabus A3

1. Name of the student: _____ 2. Roll No.: _____ 3. Date: _____ 4. Page No.: _____		5. Topic: _____ 6. Date: _____ 7. Page No.: _____	
8. Write the definition of the following terms:			
a. _____ b. _____ c. _____ d. _____ e. _____ f. _____ g. _____ h. _____ i. _____ j. _____ k. _____ l. _____ m. _____ n. _____ o. _____ p. _____ q. _____ r. _____ s. _____ t. _____ u. _____ v. _____ w. _____ x. _____ y. _____ z. _____			
9. Write the definition of the following terms:			
a. _____ b. _____ c. _____ d. _____ e. _____ f. _____ g. _____ h. _____ i. _____ j. _____ k. _____ l. _____ m. _____ n. _____ o. _____ p. _____ q. _____ r. _____ s. _____ t. _____ u. _____ v. _____ w. _____ x. _____ y. _____ z. _____			
10. Write the definition of the following terms:			
a. _____ b. _____ c. _____ d. _____ e. _____ f. _____ g. _____ h. _____ i. _____ j. _____ k. _____ l. _____ m. _____ n. _____ o. _____ p. _____ q. _____ r. _____ s. _____ t. _____ u. _____ v. _____ w. _____ x. _____ y. _____ z. _____			

PowerPoint A3

[illegible]

Single Flip Chart A3

[illegible]

Test Report A3

[illegible]

VI. Plan

1. Start small. Think "**small reversible experiments**."
2. Get a format you know well and feel comfortable with.
3. Just DO IT - ***Be the change***.
4. Hold yourself accountable

Table 1: Example of a small reversible experiment. The table shows a sequence of steps and the resulting state of the system.

Step	Initial State	Final State
1. Start	State A	State A
2. Change X	State A	State B
3. Change Y	State B	State C
4. Change Z	State C	State D
5. Change W	State D	State E
6. Change V	State E	State F
7. Change U	State F	State G
8. Change T	State G	State H
9. Change S	State H	State I
10. Change R	State I	State J
11. Change Q	State J	State K
12. Change P	State K	State L
13. Change O	State L	State M
14. Change N	State M	State N
15. Change M	State N	State O
16. Change L	State O	State P
17. Change K	State P	State Q
18. Change J	State Q	State R
19. Change I	State R	State S
20. Change H	State S	State T
21. Change G	State T	State U
22. Change F	State U	State V
23. Change E	State V	State W
24. Change D	State W	State X
25. Change C	State X	State Y
26. Change B	State Y	State Z
27. Change A	State Z	State A

VI. Plan

1. Start small. Think "small reversible experiments."
2. Get a format you know well and feel comfortable with.
3. Just DO IT - **Be the change.**
4. Hold yourself accountable.
5. Get the first one done soon - *The crappy little first draft.*
6. **LEARN** - Pick yourself up and do it again.
7. Be easy on yourself - *Learning is a PROCESS.*
8. Ask for A3s from your co-workers - **Have conversations.**
9. Share - **go public.**

VII. Follow-up

Key Learnings based on my experienced on my experience:

- A3 thinking is an **evolutional and creative process**

7. Be easy on yourself - *Learning is a PROCESS.*
8. Ask for A3s from your co-workers - ***Have conversations.***
9. Share - ***go public.***

VII. Follow-up

Key Learnings based on my experienced on my experience:

- A3 thinking is an **analytical and creative process.**
- There is **no wrong or right way** to use A3 thinking - only experiences that we learn from.
- **You don't have to be an expert** to get the **80% value.**

Eric Olsen, PhD

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Title: Everyday A3 Conversations - Practicing For Mastery

I. Background

Develop people who practice, lead, and teach critical thinking!

- ✓ "Toyota sets up all its operations as experiments and teaches the **scientific method** to its workers." (DNA of the Toyota Production System, Spear & Bowen, 1999)
- ✓ "Principle 9: Grow leaders who thoroughly **understand the work, live the philosophy, and teach it** to others." (The Toyota Way, Liker, 2004)
- ✓ While the basic **A3 thinking follows a common logic**, the precise **format and wording are flexible**, and most organizations **twink the design to fit their unique requirements**." (Managing to Learn, Shook, 2008)

II. Current Conditions

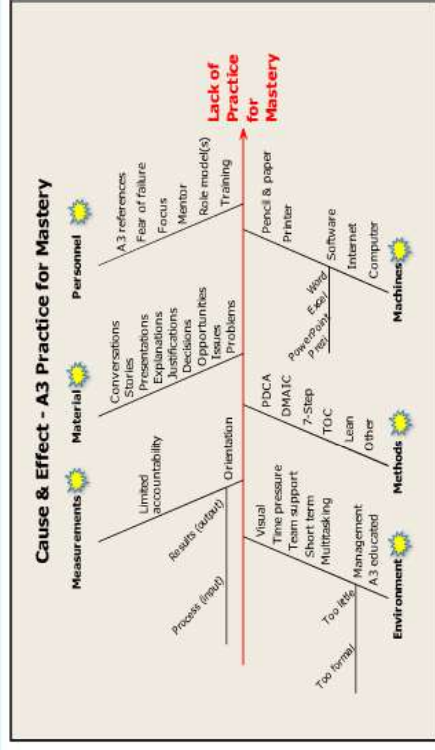
1. Companies **swim in a sea of problems** - fish see water last.
2. A3 thinking is being recognized as a major active ingredient in the "secret sauce" of lean six sigma.
3. **Engaging employees** in problem solving "moves the needle".
4. A3 problem solving and DMAIC share a **common ancestry: PDCA**.
5. **Many people have been trained** and appreciate A3s, but rarely do they gain traction beyond the classroom or first experience.
6. **Even when supported by management**, ubiquitous A3 has a hard time gaining traction.
7. Everyone is tired of having the **same old conversations** and arguments **without clear conclusions or action plans**.
8. A3s are considered **formal, complex tools at are brought out only for special occasions**.

Problem Statement: *We do not get enough practice in A3 thinking for mastery.*

III. Goals/Targets

- Increase A3 practice from infrequent to frequent.
- Make A3 thinking pervasive in the organizational culture [KATA].
- Reduce perceived barriers to A3 use (e.g. "correctness", formality, and complexity).

IV. Analysis



V. Proposed Countermeasures

"The 10,000 Hour Rule."

(Outliers, Gladwell, 2008)

1. **Look for excuses** to use an A3 approach
2. Consider the **20% A3**
3. Be an **A3 geek**

EXAMPLES



VI. Plan

1. Start small. Think "**small reversible experiments**."
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8. Ask for A3s from your co-workers - **Have conversations**.
9. Share - **go public**.

VII. Follow-up

Key Learnings based on my experienced on my experience:

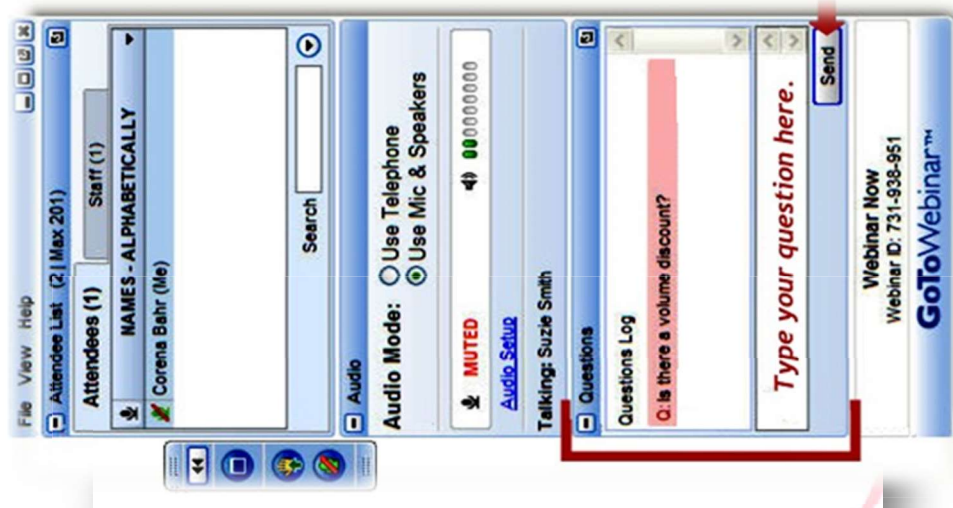
- A3 thinking is an **analytical and creative process**.
- There is **no wrong or right way** to use A3 thinking - only experiences that we learn from.
- **You don't have to be an expert** to get the **80% value**.

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Resource Links and Contacts

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