ADDRESS IT NOW.

May 5, 2021

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Plan. Implement. Excel.

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Problem Solving | Agenda

Plan

- Review the Current State
- Problem Identification and Definition
- Problem Investigation and Understanding
- Root Cause Identification

Do

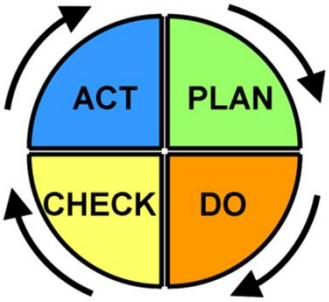
- Implement Solutions and Countermeasures

Check

- Evaluate Results

Act

- Standardize and Control



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Problem Solving Tools

PDCA	DMAIC	A3	8D/PSP
Plan	Define	Clarify the Problem	1. Create Team & collect Information 2. Describe the Problem
	Measure	Break down the Problem	
		Set a Target	3. Define Contain-ment Actions
	Analyse	Analyze the Root Cause	4. Analyze the Root Cause
		Develope Countermeasures	5. Define possible corrective Actions
Do	Improve	See Countermeasures	6. Implement corrective Actions
Check	Control	Evaluate Results & Processes	7. Define Actions to avoid Recurrence 8. Congratulate your Team
Act		Standardize Success	

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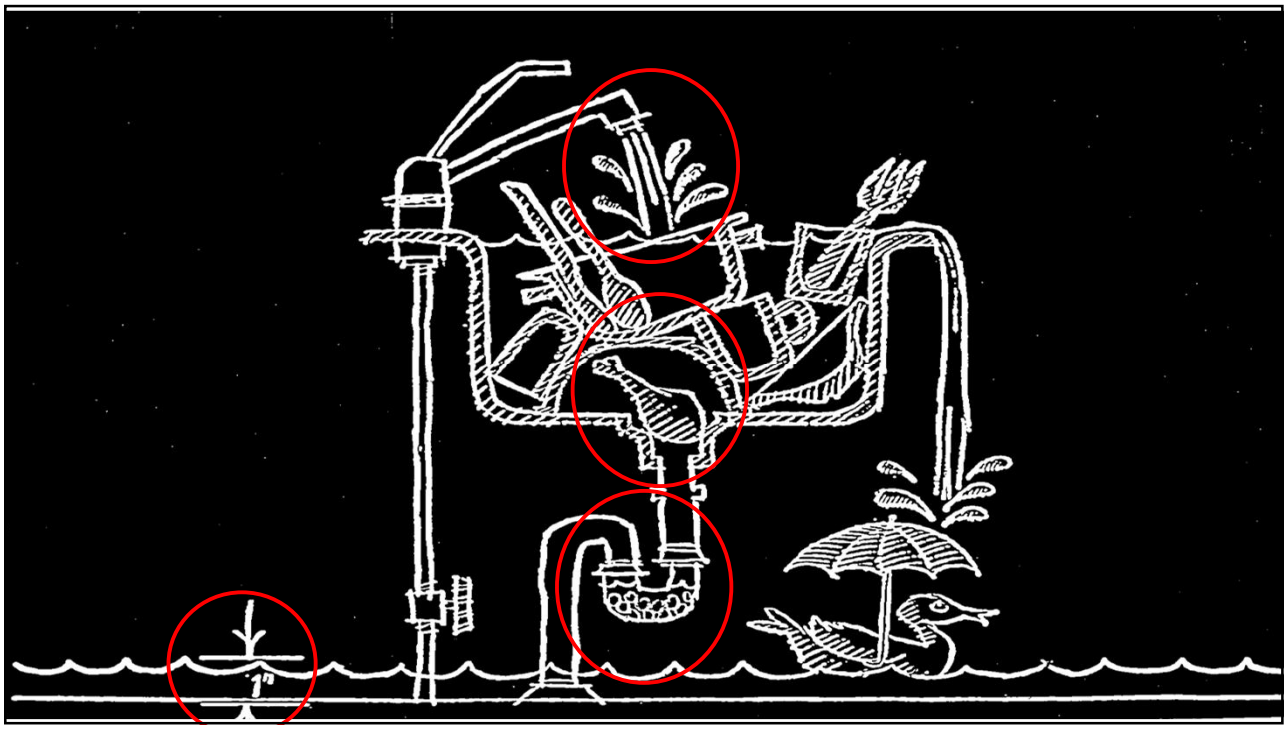

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Top 10 Problem Solving Pitfalls

10. Band-aide versus cure. *We don't have time to work on this*

9. Treat symptom versus root cause. *We use over-the-counter medicine*

8. Try to solve "big" problems. *We try to end world hunger*

7. Solution looking for a problem. *To a hammer, everything looks like a nail*

6. Opinion versus fact-based approach. *In God we Trust, everyone else bring data*

5. What problem are we working on? *Let's work on everything!*

4. Blame someone versus focusing on the process. *Whodunnit?*

3. Not listening to the one closest to the problem. *Problems don't respect title*

2. Vague problem descriptions. *It doesn't really work*

1. Not using a systematic scientific approach. *Problem is usually smarter than us*

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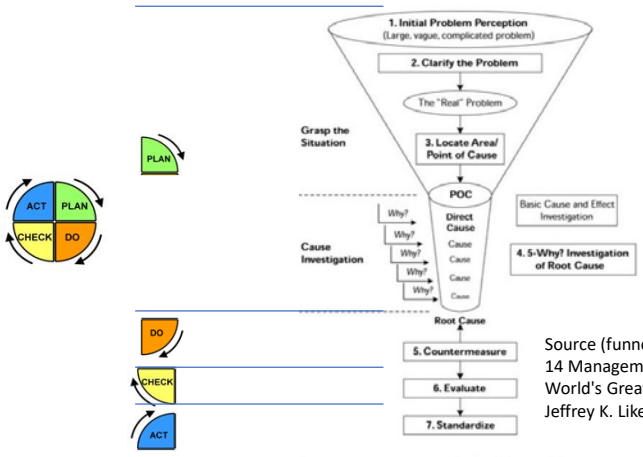
Problem Identification and Definition

Funnel large problems into specific problems



Source (funnel): The Toyota Way
14 Management Principles from the World's Greatest Manufacturer
Jeffrey K. Liker

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Problem Identification and Definition

Grasp the Situation By Getting all the facts

Pull Together Facts from Metrics

- Current action / measurements occurring?
- How often is problem occurring?
- What are the circumstances?
- What time is the problem occurring?

Interview those local to the problem

- Operators
- Supervisors
- Customer Service

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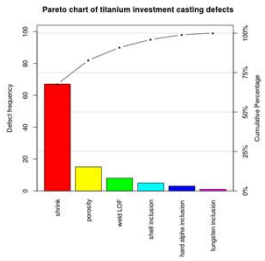
Problem Identification and Definition

Grasp the Situation By Getting All the Facts

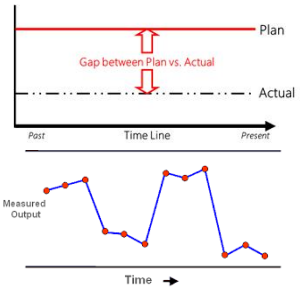
Talley Sheets
Pareto Analysis

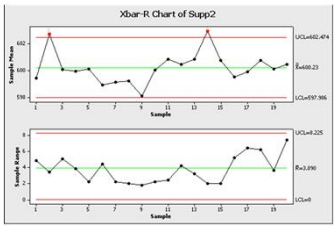
Reason	Frequency	Comments
Label mismatch	//	
Label missing	/	
Incorrect label	///	
Wrong color	𝍸 𝍸 /	Green 𝍸 𝍸
Damaged label	/	Blue /
Other	//	



Run Chart Analysis…

- * Plan vs Actual Gap
- Trending
- Process Variation
- Process Control





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Problem Identification and Definition

Grasp the Situation By Writing a Good Problem Statement

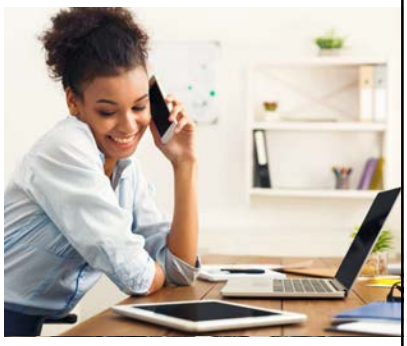
A good ✓ versus a Bad ✗ problem statement…

"On-time delivery is currently at 98% and our customers expect ~100% (6σ) on-time deliveries."

✓ ***Problem is identified, specific, measurable and attainable.***

"Our customers say our on-time delivery is not very good."

✗ ***Problem is too broad and not specific / measurable / attainable.***



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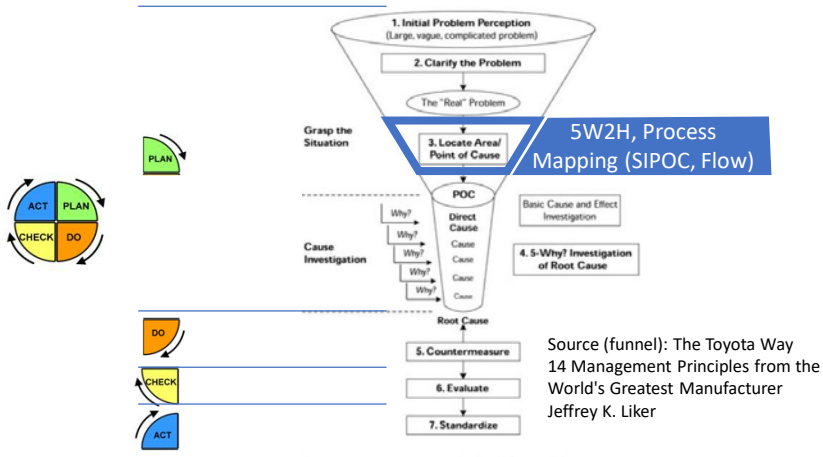
Problem Investigation and Understanding

The next step in the process before determining cause



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Symptom vs. Cause (POC) vs. Root Cause vs Problem

- Problem – Deviation from a standard.
- Root Cause – Trigger for the deviation.
- Cause (POC) – The "why" of the deviation.
- Symptom – Signal of the deviation.

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Problem Investigation and Understanding

Understanding Symptoms vs. Problems

Symptom	Problem
• Excessive production noise • Shortage of parts • Can't assemble • Can't make part to print	• Machine motor bearings are bad • Fasteners received on May 16 from XYZ Co. contained 200 parts instead of 250 • Insert was placed with wrong orientation in the frame • Assembly print for subassembly 123 is missing fastener part #

What caused each of these?

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Problem Investigation and Understanding

5W2H Problem Understanding

1 - Who?

2 - What?

3 - Where?

4 - When?

5 - Which?

and 2 How questions…

- 1 – How much / many?
- 2 – How often?

Answering these questions leads to a deeper understanding of the problem.

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Problem Investigation and Understanding

5W2H Problem Understanding

1 - Who?

2 - What?

3 - Where?

4 - When?

5 - Which?

and 2 How questions…

- 1 – How much / many?
- 2 – How often?

- Specifically detected the problem?
- Might be involved in the problem?
- May have special resources or access to useful information?
- Might gain from a resolution of the problem?
- Is affected?

NOT… "Who can we blame?"

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Problem Investigation and Understanding

5W2H Problem Understanding

1 - Who?

2 - What?

3 - Where?

4 - When?

5 - Which?

and 2 How questions…

- 1 – How much / many?
- 2 – How often?

- Is the Object with the Defect?
- Is the specific Defect?
- Are the requirements of the situation?
- Are the difficulties or risks involved?
- Are the deviations or gaps that are being observed?

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Problem Investigation and Understanding

5W2H Problem Understanding

1 - Who?

2 - What?

3 - Where?

4 - When?

5 - Which?

and 2 How questions…

- 1 – How much / many?
- 2 – How often?

- Is the defect first found?
- Geographically has the defect been found?
- Is the defect on the object?

Consider…

Location

Place

Focal points of the problem

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Problem Investigation and Understanding

5W2H Problem Understanding

1 - Who?

2 - What?

3 - Where?

4 - When?

5 - Which?

and 2 How questions…

- 1 – How much / many?
- 2 – How often?

- Was the defect first detected on the object?
  - Specific date and time.
  - Timeline
- Since first detecting the defect, has it been detected again?
  - Consider… shifts, schedule, dates, and timeliness of the situation.

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Problem Investigation and Understanding

5W2H Problem Understanding

1 - Who?

2 - What?

3 - Where?

4 - When?

5 - Which?

and 2 How questions…

- 1 – How much / many?
- 2 – How often?

- Certain place, location or sequence in the process?
- Machine, tool, fixture?
- Certain person, group or division?

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Problem Investigation and Understanding

5W2H Problem Understanding

1 - Who?

2 - What?

3 - Where?

4 - When?

5 - Which?

and 2 How questions…

- **1 – How much / many?**
- 2 – How often?

- Many (or to what extent)…
  - objects are affected by the defect?
  - defects are on each object?
  - complaints are attributed to the defect? (Some or all)
- Is the trend…
  - Staying the same?
  - Getting worse / better?
  - Random?

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Problem Investigation and Understanding

5W2H Problem Understanding

1 - Who?

2 - What?

3 - Where?

4 - When?

5 - Which?

and 2 How questions…

- 1 – How much / many?
- **2 – How often?**

- Often does or has this problem occur(red)?
  - It happened one time?
  - Frequency per day, week, etc.?
- Do the defects appear?
  - Continuous or Sporadic?
  - Any perceptible pattern? (periodic or very specific)

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Problem Investigation and Understanding

5W2H Problem Understanding – Is/Is Not

	IS…	IS NOT…
What Object	Piston Pins	Shafts
What Deviation	OD oversize	OD undersize
Where Geographically	On Grind Line 1	On Grind Line 2,3
Where on Object	On the OD	On the ID
When detected	Feb. 4th, 8:00am	B4 Feb 4th, 8:00am
When found since	Feb 4th-present	B4 Feb 4th
When in mfg. cycle	In inspection	On Grind Line
How many objects	Entire box	Partial box
How many defects on the object	Entire OD	Portion of OD
What is the trend	Going down	Going up or stable

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IMEC **Day 2 Homework: 5W 2H Is / Is Not Worksheet**

Initial Problem Description:
Write your problem statement here.

5W 2H	IS	IS NOT
1) Who? - Noticed - Is Affected		
2) What? - Defect / Deviation - Process		
3) Where? - Geographically - Specifically		
4) When? - Date / Time - First / Last occurance		
5) Which? - Step in the process - Machine, tool, etc.		
1) How often? - Trends and Patterns - Frequency		
2) How much / many? - Occurances - Magnitude / Impact		
Clarified Problem Description:		

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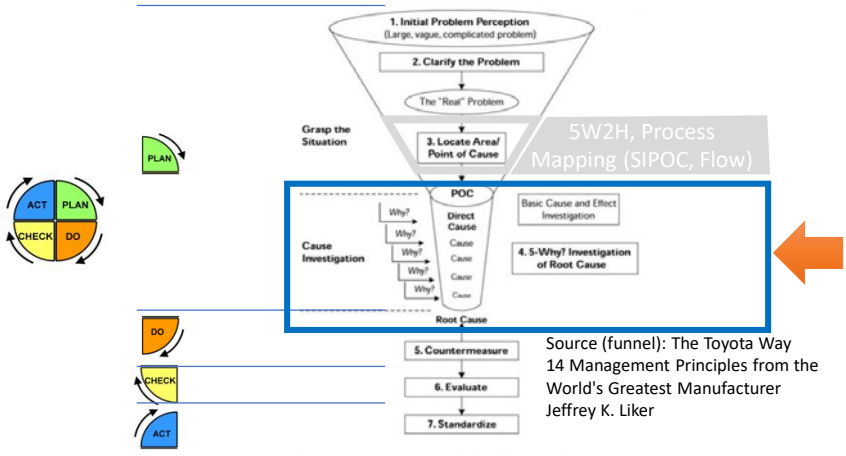
Root Cause Identification

Finding the True "root cause(s)" of the problem



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Root Cause Identification

Types of Root Cause

Defect Root Cause

- What physically caused this problem?

Systemic Root Cause

- What failed in the system(s) to allow this to happen and/or not be detected?

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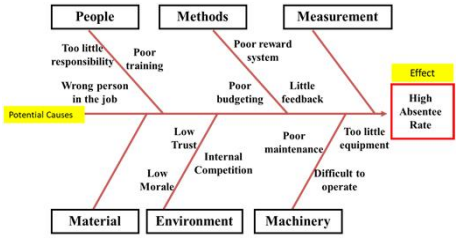
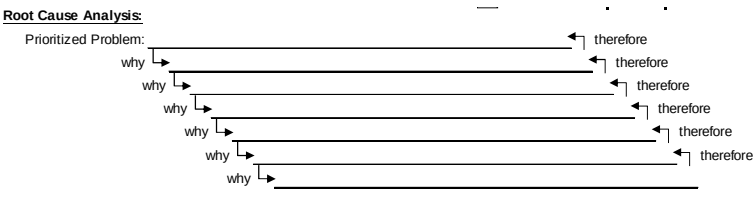
Root Cause Identification

Tools to use to get the "true" Root Cause

Two (2) tools used frequently for getting to the "true" root cause of a problem are "Fishbone" diagraming and the 5 Why(s).





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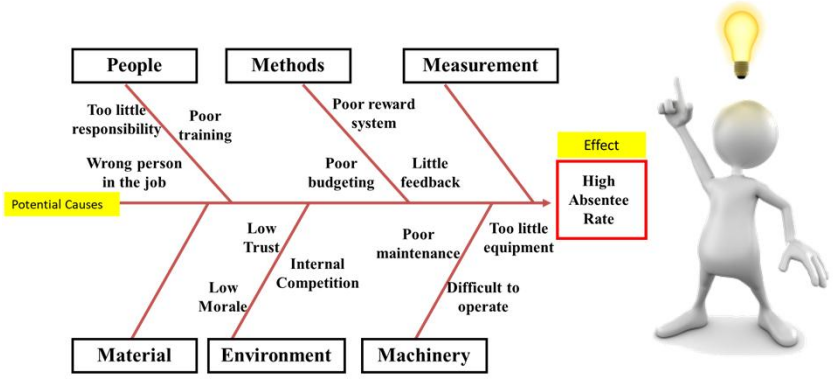
Root Cause Identification

Fishbone / Cause and Effect Diagram "Ishikawa"

A brainstorming method used to generate and group "possible" problem causes, then systematically evaluate the causes and determine which are most likely to be root causes.



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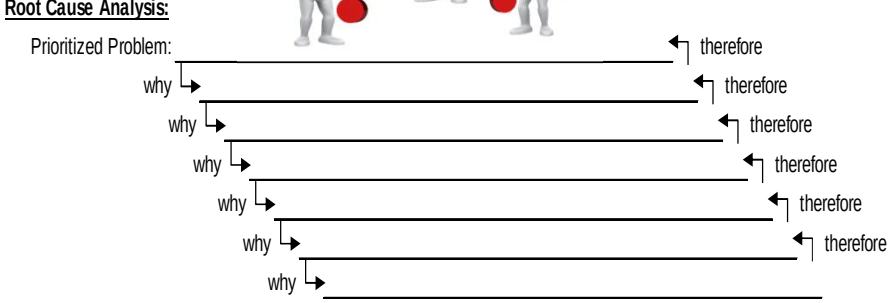
Root Cause Identification

5 Why(s) Analysis



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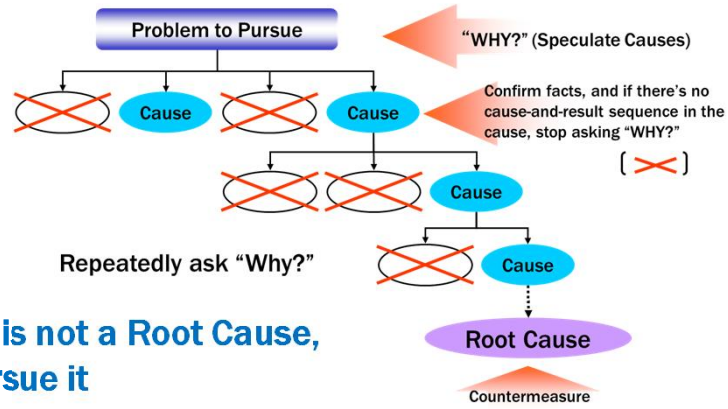
Root Cause Identification

In order to clarify the "true" Root Cause of a problem, thoroughly investigate the process.



If an item is not a Root Cause, do not pursue it

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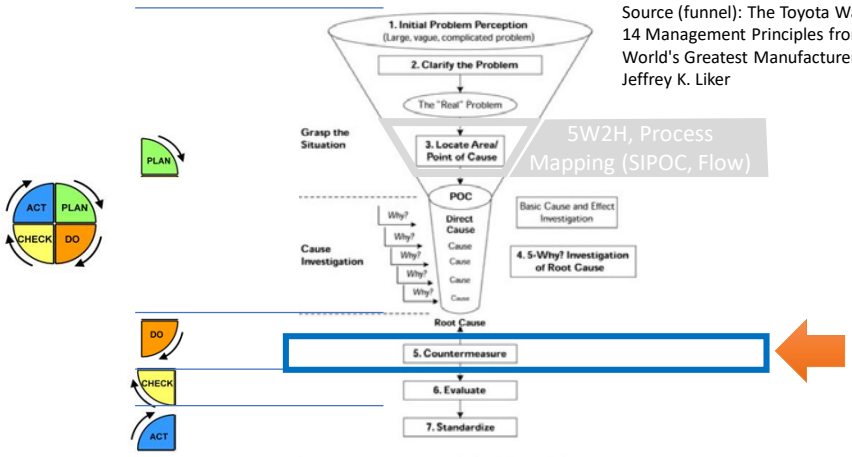
Evaluate Results | Results of Your Investigation

Did we permanently fix it?



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5W2H, Process Mapping (SIPOC, Flow)

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Implement Solutions/Countermeasures

How do we permanently fix?

P-I-C-K Method

Identify Actions and group into:

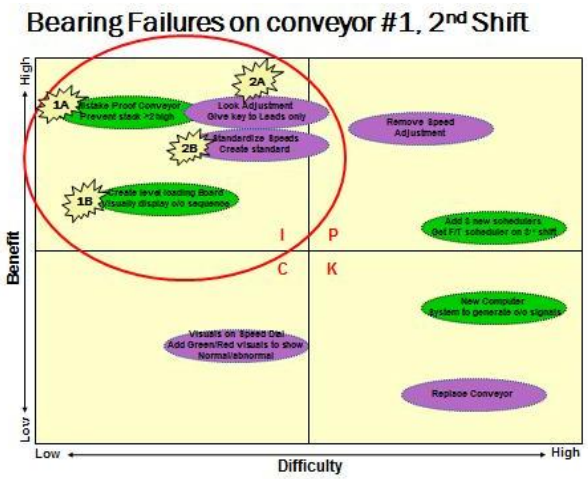
BENEFIT vs DIFFICULTY

P Plan to Do
High benefit, Make a plan how to do it
(Could be an A3, RIE or a project)

I Implement
High Benefit, Easy to Do. Implement Now
(Basic Problem Solving or Just Do It's)

C Choose To Do
Low benefit, but easy to do
(Determine if there is value)

K Kick Out
Low benefit and difficult to do. Kick it out!



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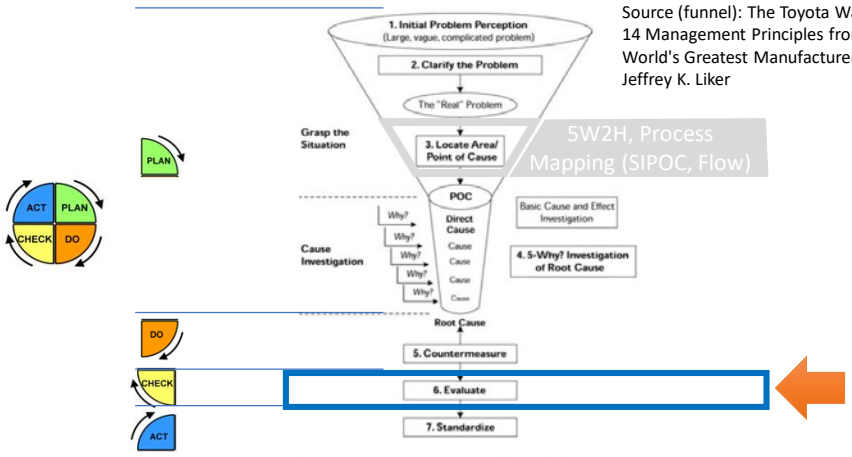
Evaluate Results | Results of Your Investigation

Did we permanently fix it?



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Evaluate Results | Results of Your Investigation

Methods to Evaluate

What data has been gathered?

What methods can be used to structure that data?

How can you evaluate?

Concept - Same vs. Different

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Evaluate Results | Results of Your Investigation

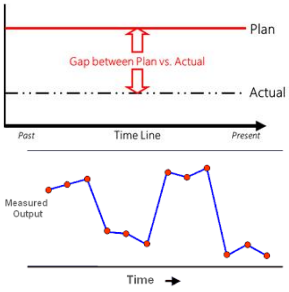
Did we permanently fix it?

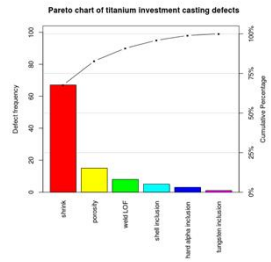
Talley Sheets
Pareto Analysis

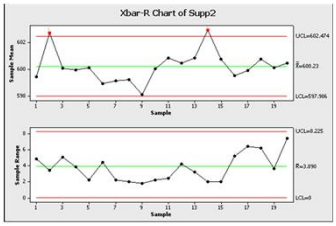
Run Chart Analysis…

- * Plan vs Actual Gap
- Trending
- Process Variation
- Process Control

Reason	Frequency	Comments
Label mismatch	//	
Label missing	/	
Incorrect label	///	
Wrong color	//// //// /	Green //// ////
Damaged label	/	Blue /
Other	//	







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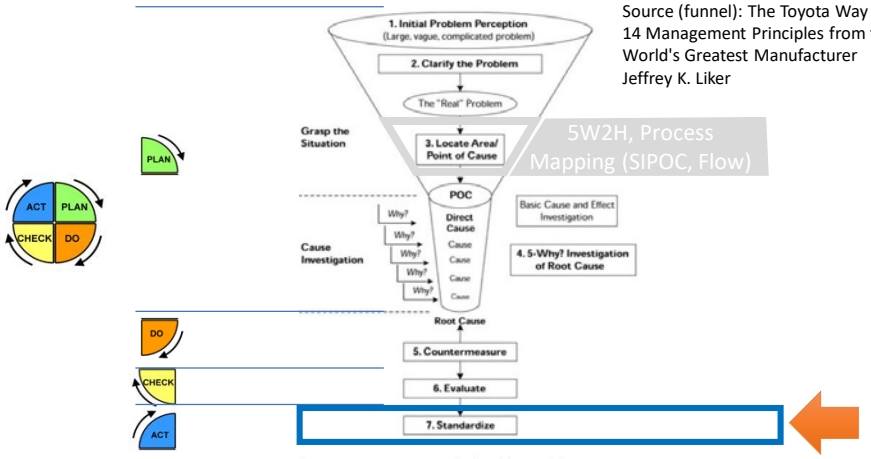
Implement Solutions/Countermeasures

Standardize to Sustain the Outcome



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Helpful Coaching

Less Helpful	More Helpful
▲ Is that really the problem you need to solve?	⊙ Exactly what's the problem are you trying to solve?
▲ Why do you think that's a problem?	⊙ Can you describe what's happening vs. what should be?
▲ Why don't you look at _____?	⊙ What have you looked at or heard?
▲ How is that your root cause?	⊙ What makes you sure you've got a cause/effect link?
▲ Have you thought about trying ____?	⊙ What have you thought of trying?
▲ Are you sure that's going to work?	⊙ What impact do you expect that CM to have?

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Thank You!

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