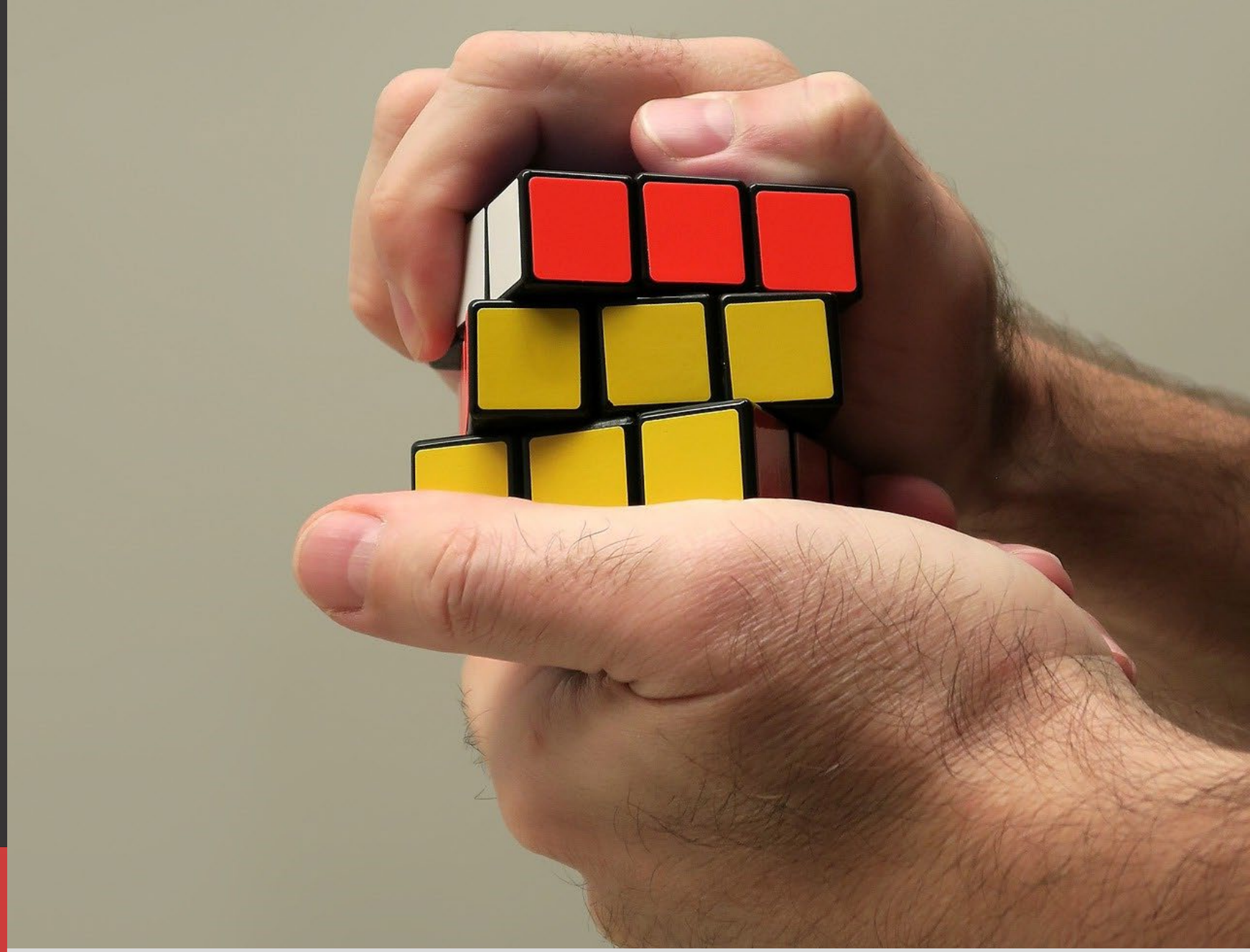
A3 Method – A Practical Problem Solving Approach

Half Day Workshop

Embracing Excellence LEAN Conference
June 6, 2022



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BIO

Jim Neirinck, President JCN Enterprises

Experience, Education and Interests:

- Consulting – LEAN, Strategic Planning, Executive Coaching
- General Manager, JELD-WEN Windows & Doors
- Senior Director Operations, Director Quality / C.I. / Mfg Eng - Kitchen Craft Cabinetry
- President, Erosion Control Blanket
- Aerospace Program Manager & Plant Manager, Cormer Aerospace
- Senior Program Manager, Production Manager, Aircraft Engineering - Bristol / Magellan Aerospace
- Lean Black Belt, Lean Sensei Institute
- APIC's Certified in Production and Inventory Control (CPIM)
- Certified in Management (CIM), Canadian Institute of Management
- Member of Board of Directors, Royal Aviation Museum of Western Canada

Survey: By Show of Hands....

What is your formal problem solving experience using tools like A3, DMAIC, KATA, etc:

1. Little or no experience
2. Used it but only in training courses
3. I have participated a few times but not lead
4. I regularly use formal PS tools in a team environment

Agenda

Part 1 – Right Way to A3

- Expectations
- Why Do We Need an Effective PS Method?
- Where Do We Use it?
- How to Implement
- A3 Method

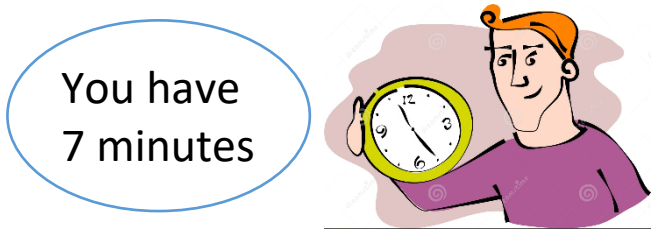
Part 2 – Problem Case Study

- Problem Overview
- Breaking down the problem (working the left side)
- Root Cause Analysis
- Do, Check, Act (working the right side)
- Yokoten / Best Practice Sharing

Part 3 – Putting it All Together

- How to Avoid Roadblocks
- Round Table & Hansei / Call to Action

Know Your Table

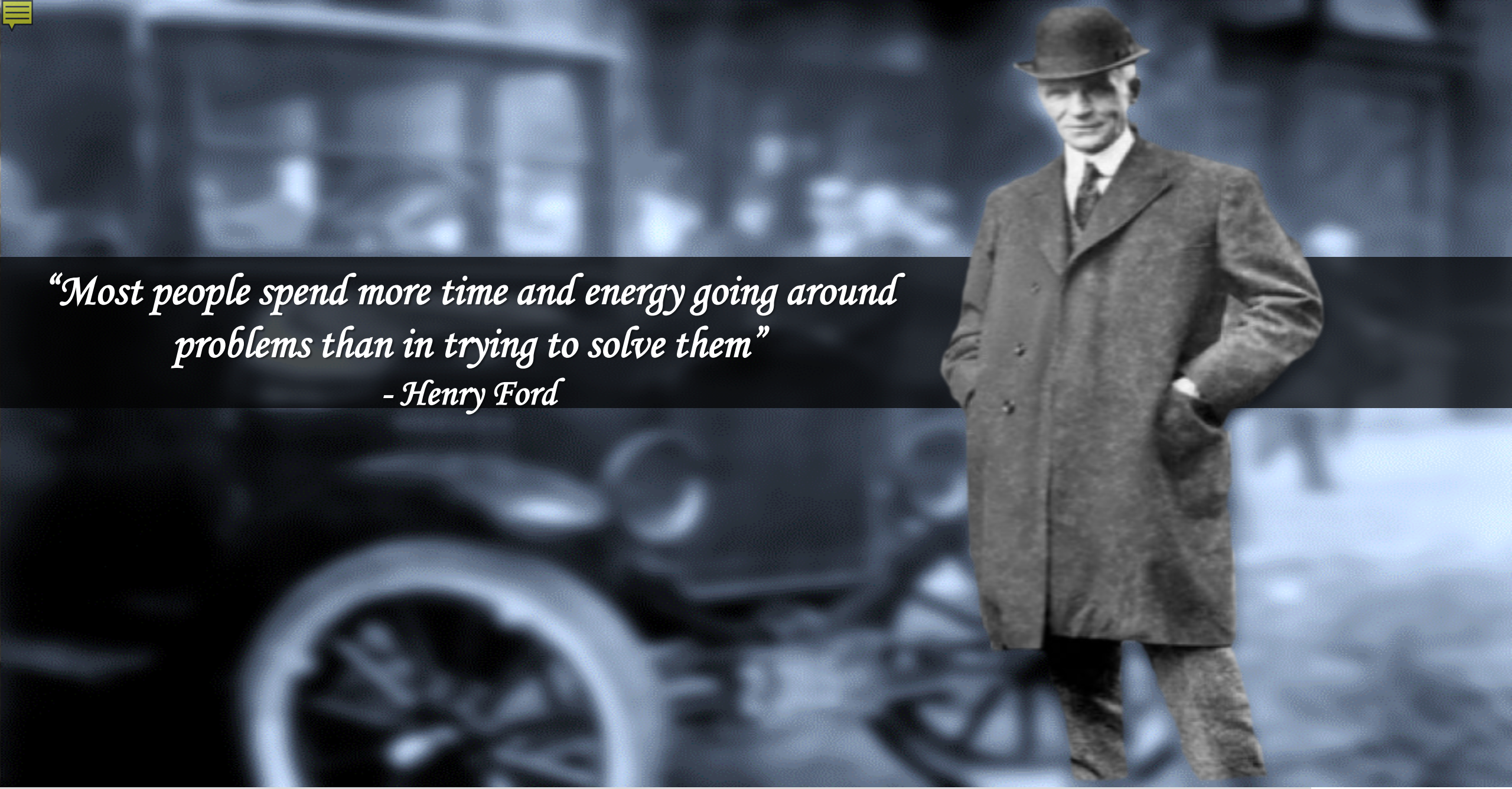


You will have 7 minutes to introduce yourself:

- Name:
- Company:
- Role:
- Expectations for Workshop
    - Why are you here?
    - What do you want to get out of this workshop?

Then as a group:

- Agree on your 1 to 3 main expectations for this workshop
- Then nominate someone as spokesperson to present
- (Bonus points if you come up with a Team / Table name!)


"Most people spend more time and energy going around problems than in trying to solve them"
- Henry Ford

70%

of organizations are attempting
“more than” or “significantly more than”
they can reasonably handle *

* Poll of 700+ companies by KMartin Group

Key to Apple's Success Under Steve Jobs

" ***saying no*** to 1000 things to make sure we don't get on the wrong track or try to do too much."

"it's only by ***saying no*** that you can concentrate on the things that are really important."

- Steve Jobs

How Much is On Your Plate?

You have 7 minutes

You have 7 minutes to Discuss:

- Approximately how many objectives, projects, CI initiatives, issues / problems you are dealing with daily / weekly?
- How effective are you and your teams at prioritizing and getting problems resolved so they don't reoccur?
- Assign a spokesperson to summarize …

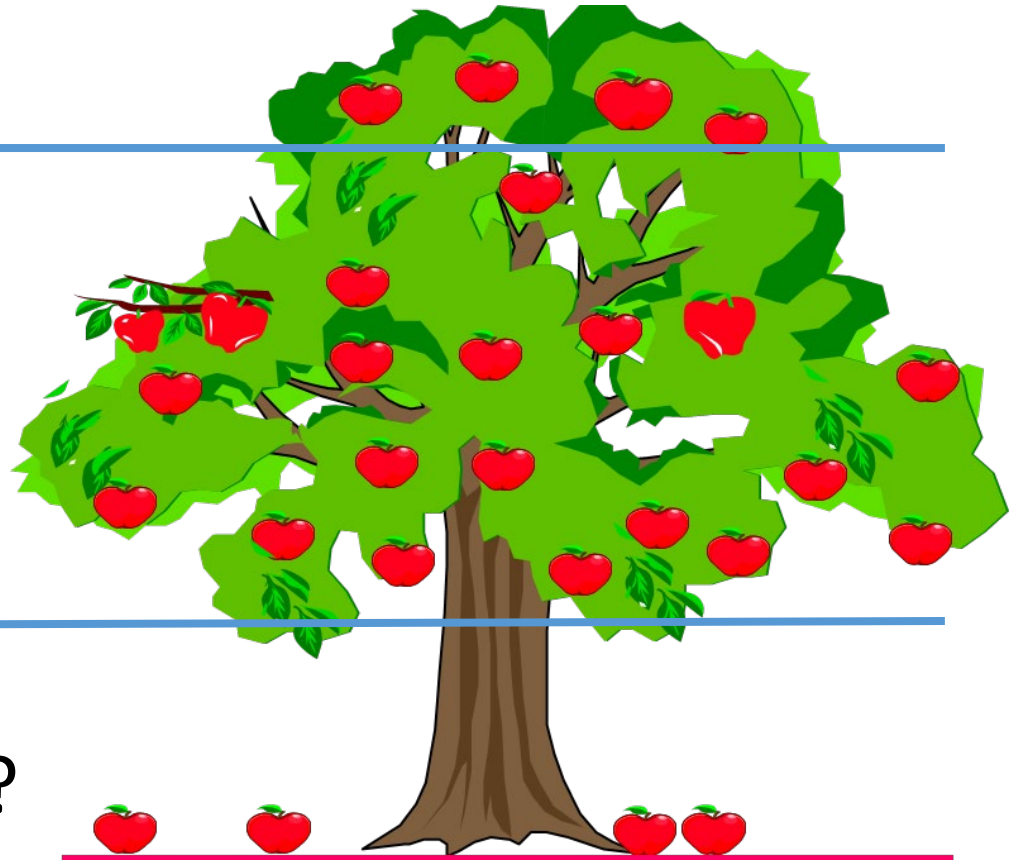
Why the Problem with Problem Solving?

- Many companies do not effectively solve problems or achieve their objectives
- Not all levels or all employees know or are aligned with the company's goals and objectives
    - Too much 'Firefighting'; spending time on 80% issues rather than 20% causes
    - Too many objective and priorities; Chasing 'squirrels' OBE
    - Everyone not aligned or working toward main objectives for the quarter or year
    - Visual Communication methods and systems lacking
    - Lack standardized process to regularly review main objectives and take action when off-track

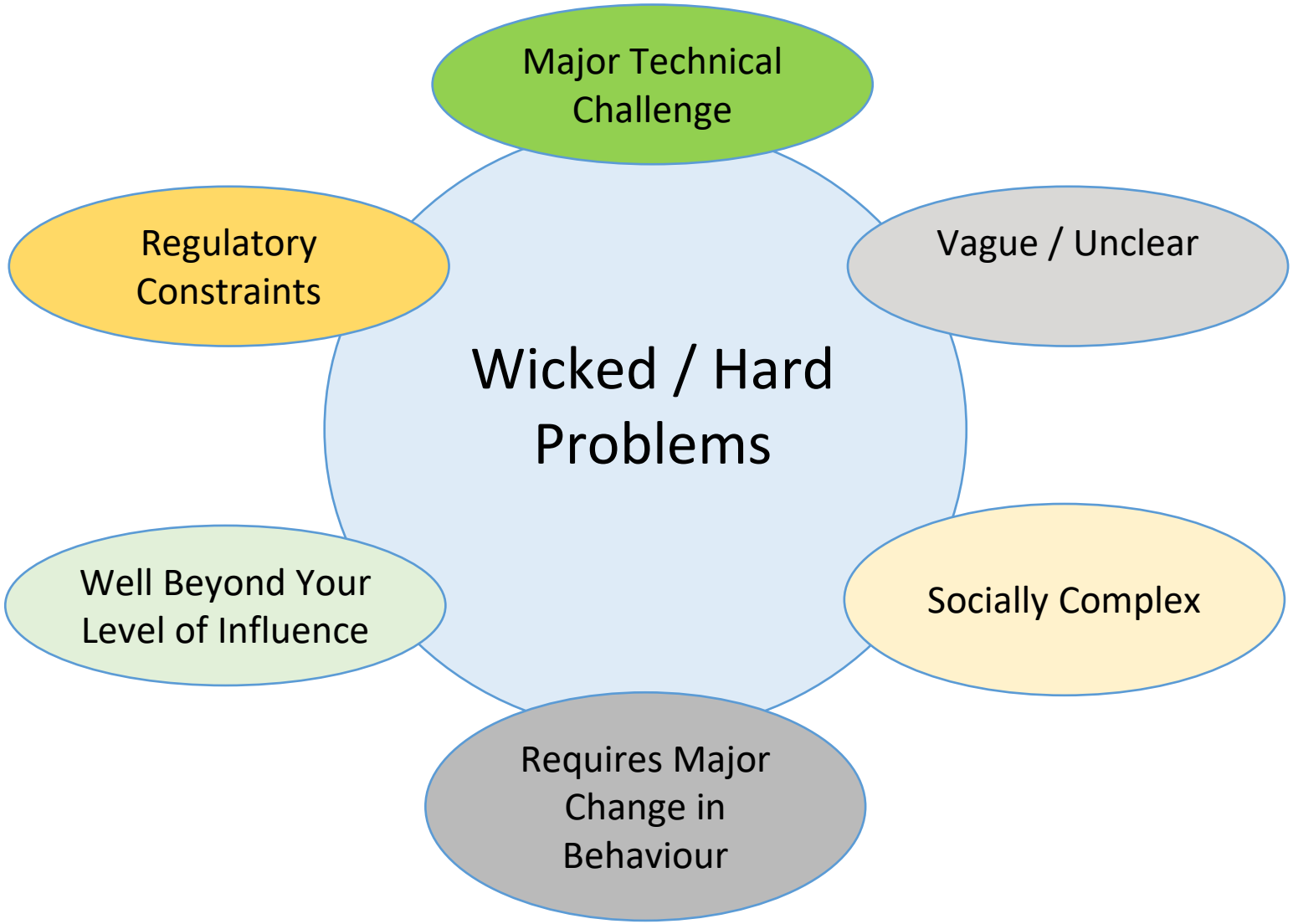
Main Point is simply most lack a method / system that focuses and aligns the team on the critical few priorities and opportunities (aka real problems / causes)

Wicked Hard

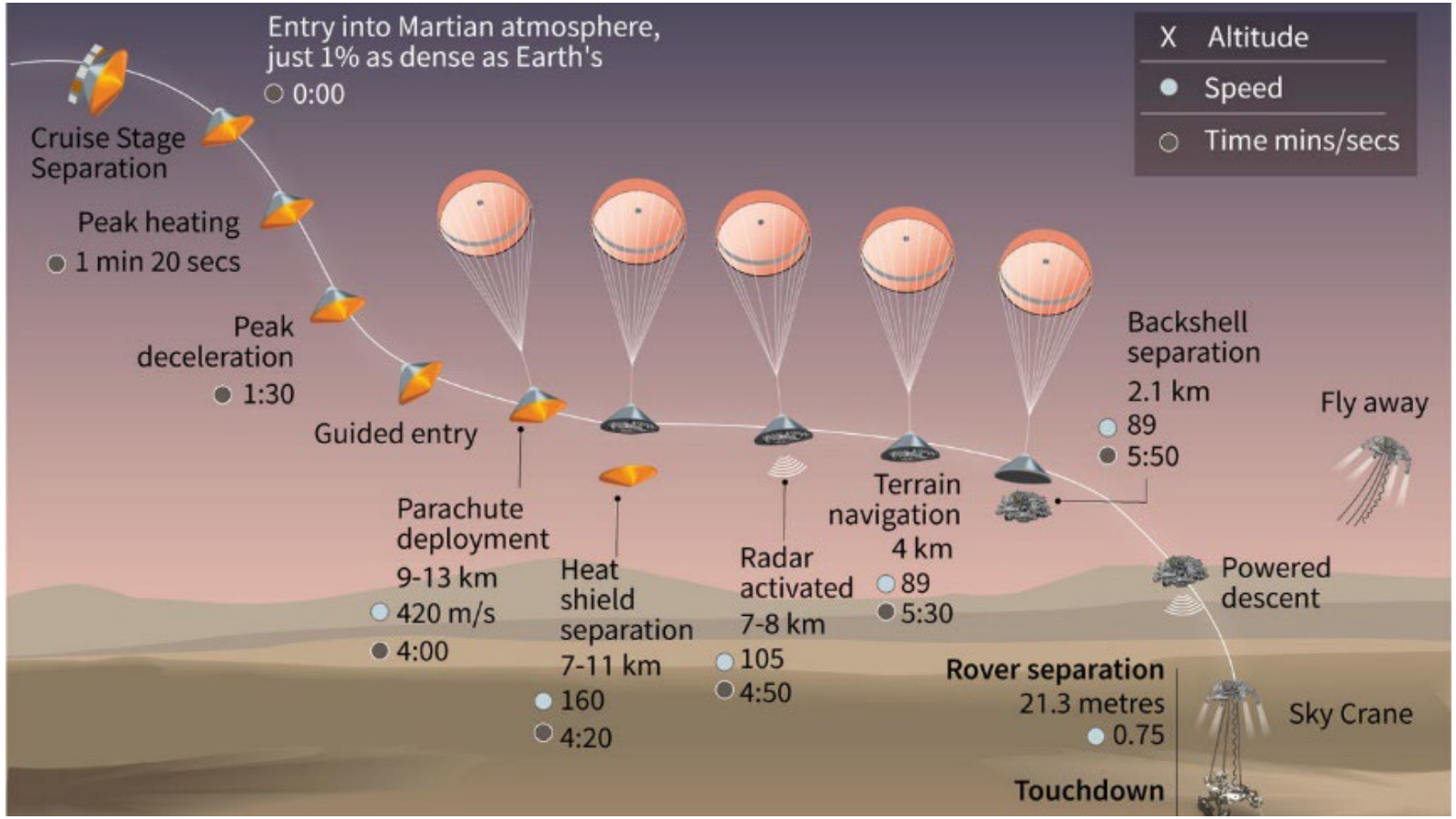
Medium to Hard

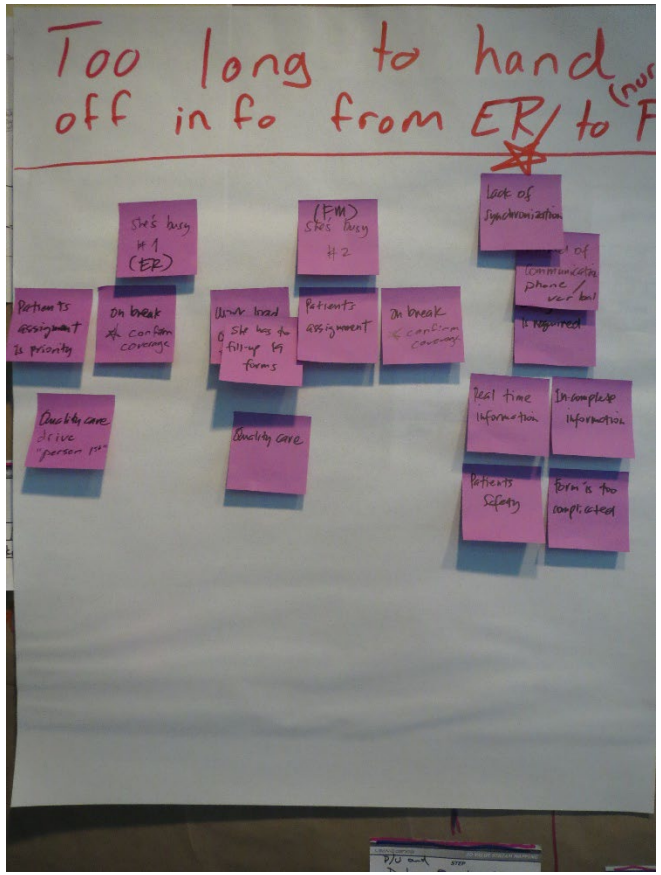


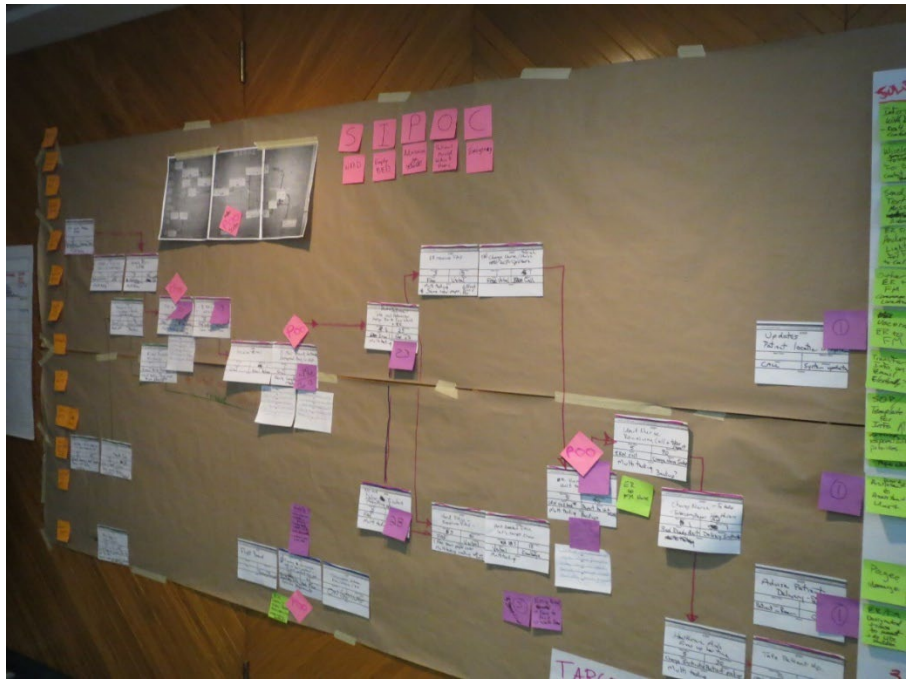
Just Go Do…?


Major Technical Challenge
Regulatory Constraints
Vague / Unclear
Wicked / Hard Problems
Well Beyond Your Level of Influence
Socially Complex
Requires Major Change in Behaviour

Let's Put a Rover on Mars PLUS a Drone!



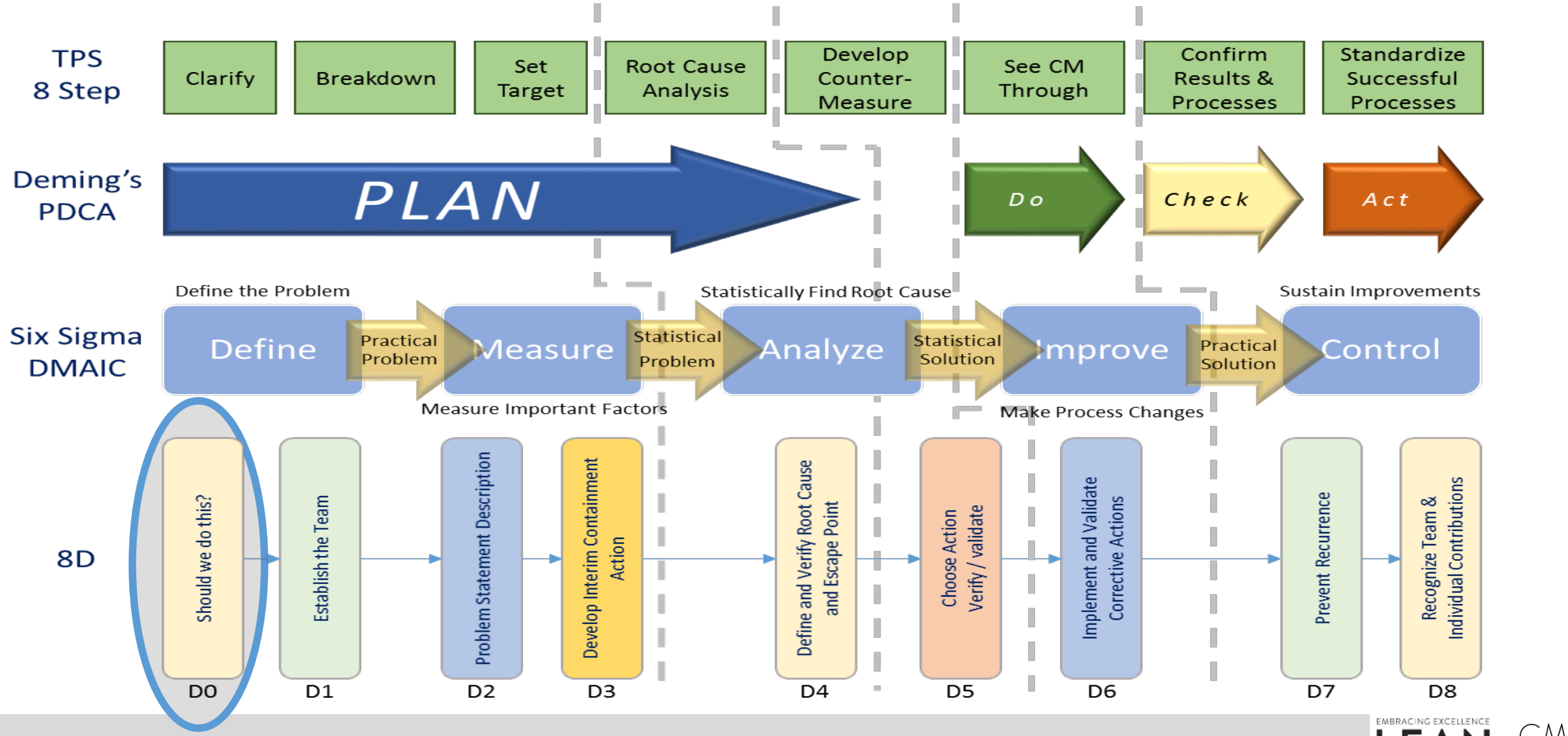




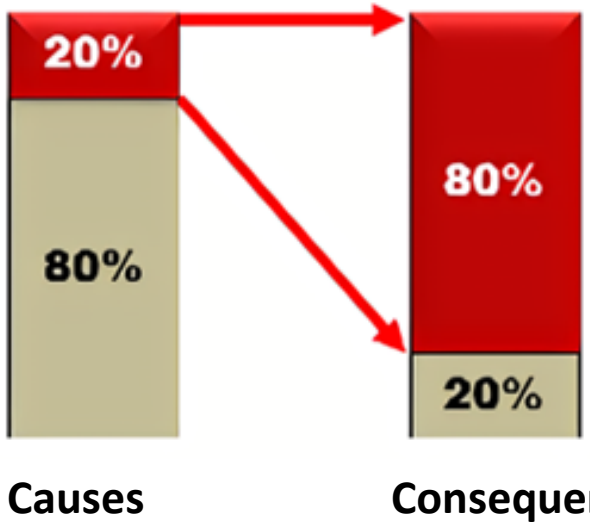
Service / Healthcare Example

- Solution unknown
- Moderate / Hard
- Long standing issue
- Not enough time to ‘fix’
- Remember 80/20
- A3 great for these situations

There are many types of problem solving methods



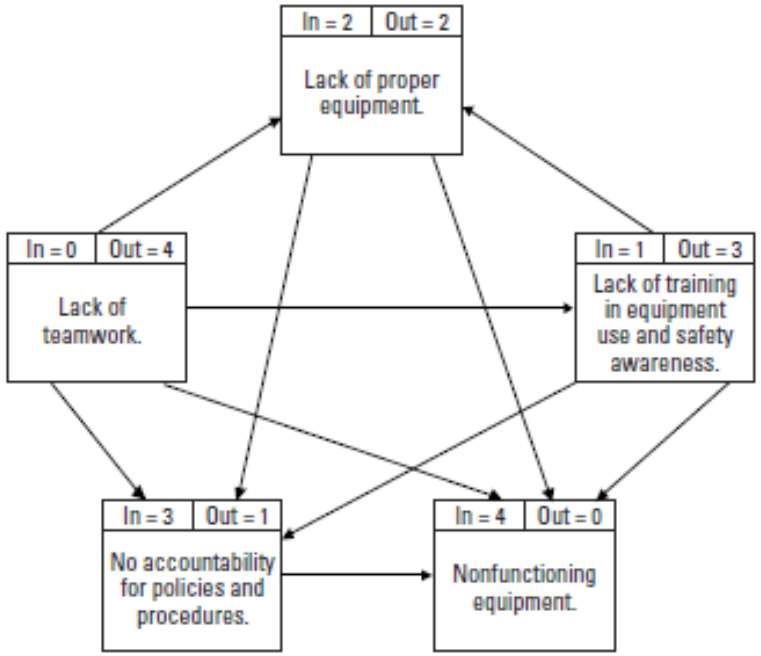
80/20 Rule



- 80% of consequences flow from 20% of causes
- 80% of results come from 20% of effort

20% of the time expended produced 80% of the results
80% of problems can be avoided by eliminating 20% of causes
20% of the streets handle 80% of the traffic
80% of our sales come from about 20% of our products
20% of the people cause 80% of the problems
80% of your learning will come from about 20% of these slides

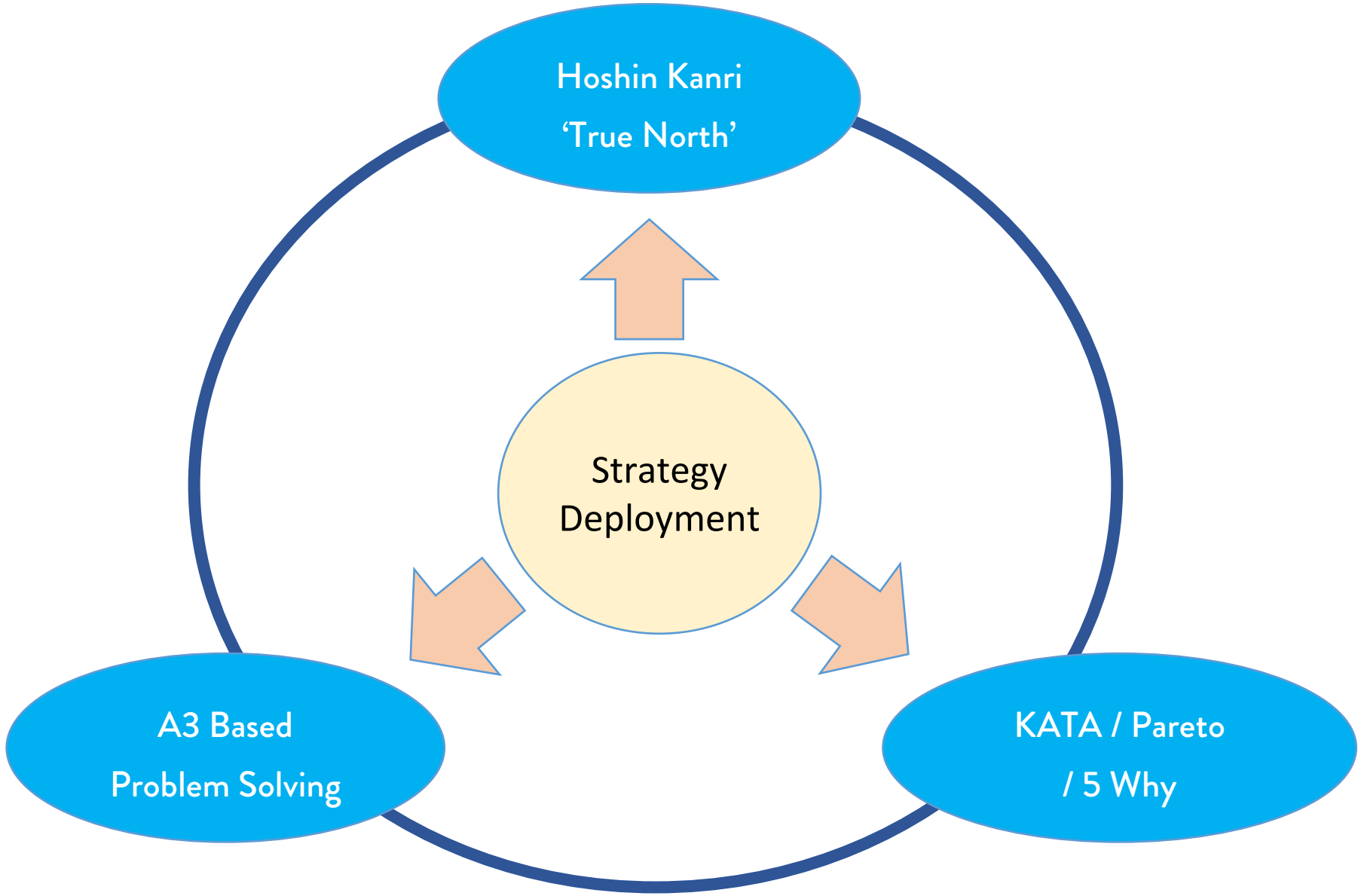
Inter-Relationship Diagrams (IRD)



Note: The numbers stand for the number of arrows leading into and out of each problem.

- Write each problem on a sticky note
- Start at top and moving clockwise ask “is there a relationship between these two?”. If yes ask “which item is driving or causing the other?”.
- Draw an arrow between the two indicating direction of influence
- After relating each item to every other item, count the number of arrows going ‘in’ and ‘out’ of each item. The item with the most arrows going out is the driving problem
- Discuss and agree on the top driver problems to work
- Does wonders to gain team alignment on main issue(s) and driving problem(s) that need to be solved

- Credit: ASQ



Focus on the Critical Few

Key Objectives for the Year: <u>No more than 3</u>

Example: Improve Supplier Quality to 95% by End of Q4

Top Level Priorities:

Example: Establish Supplier Scorecard

Example: Develop Source Inspection Process

Targets to Improve:

Example: All Tier 1 Suppliers to Have Scorecards by Q2

= Problem Statement: "No Scorecard Process"

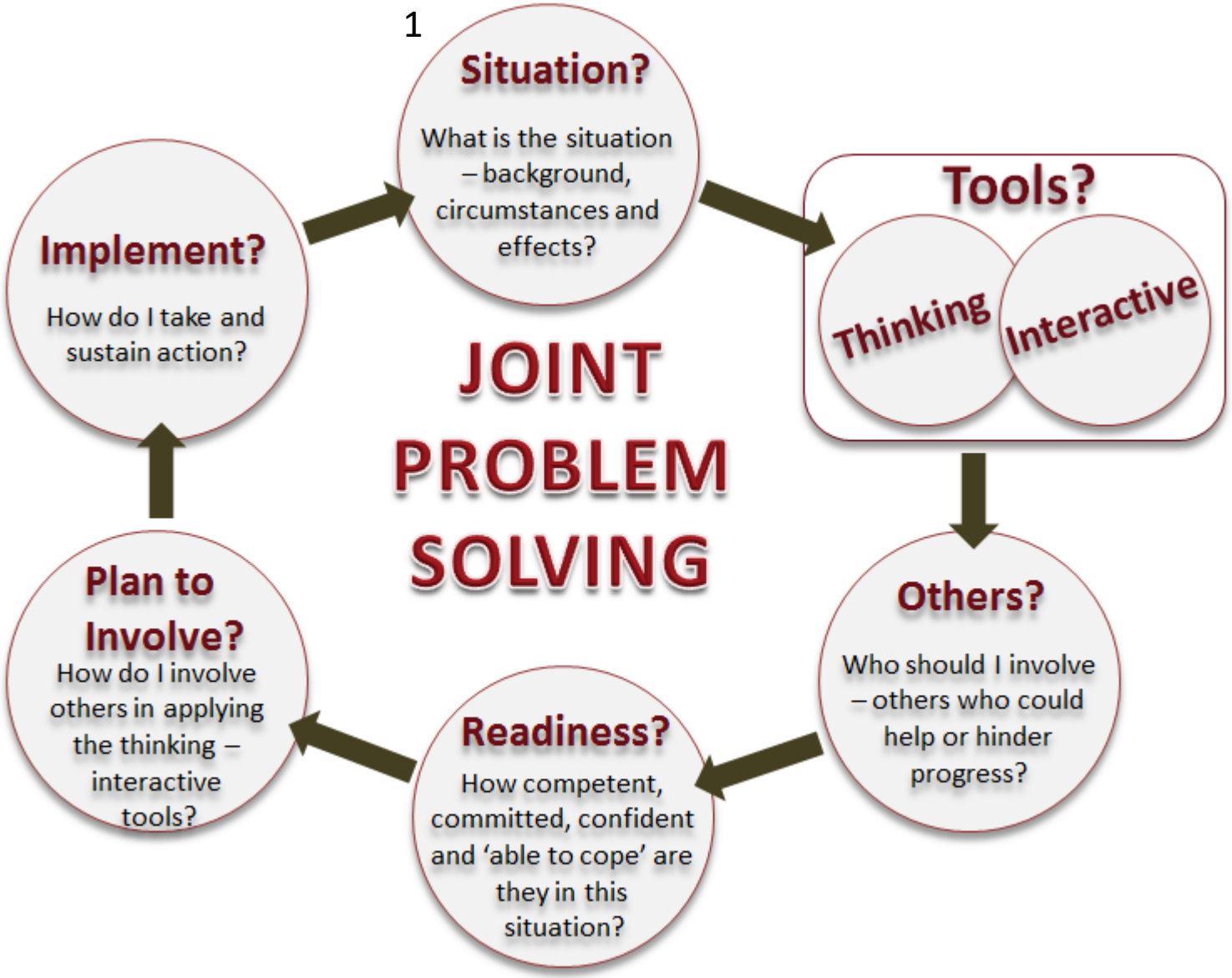
Example: Suppliers being source inspected to have 99% Quality Rating by Q3

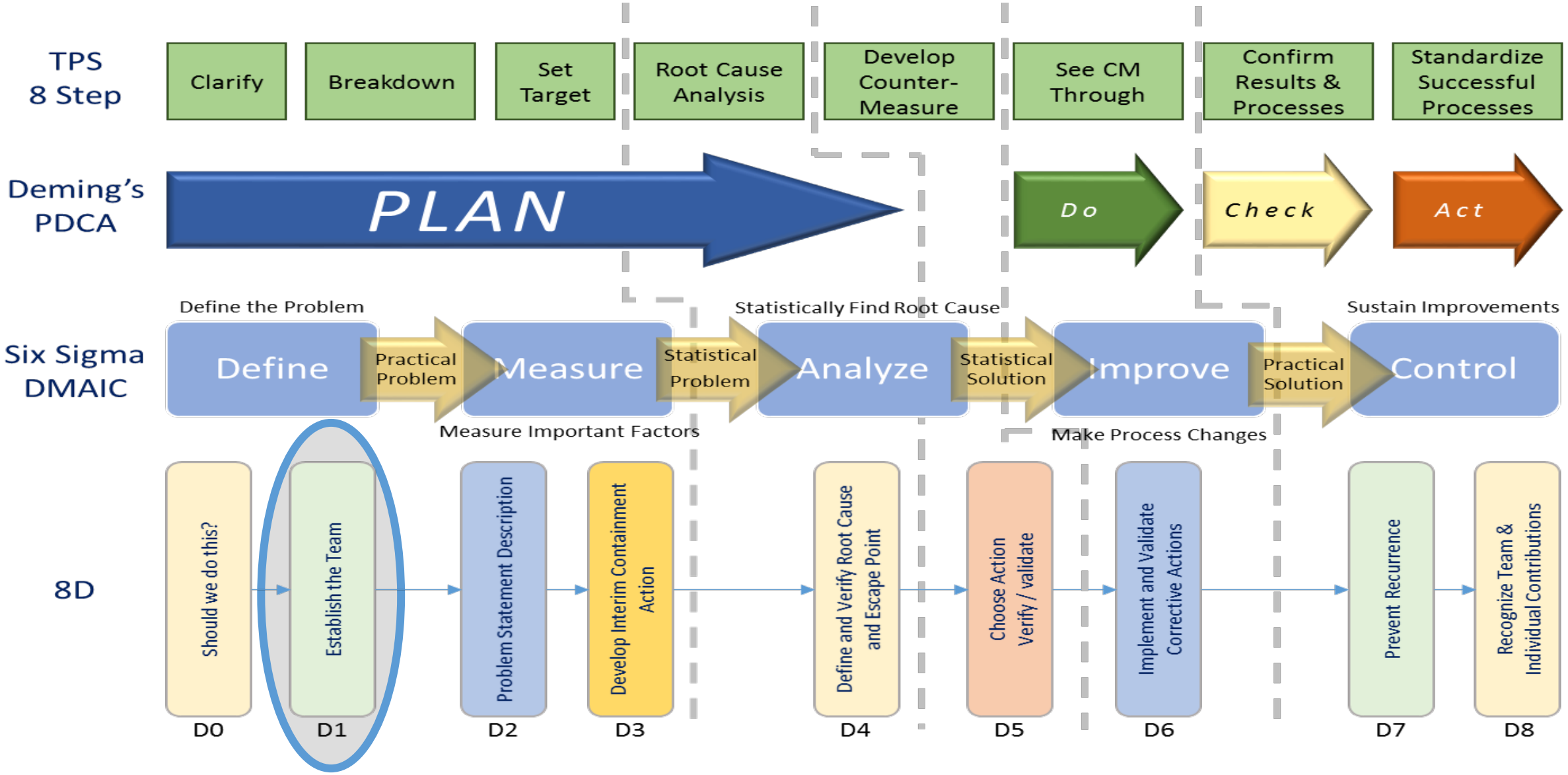
= Problem Statement: "No Source Inspection Process"

A3 Used When → Major Impact or Repetitive Issues

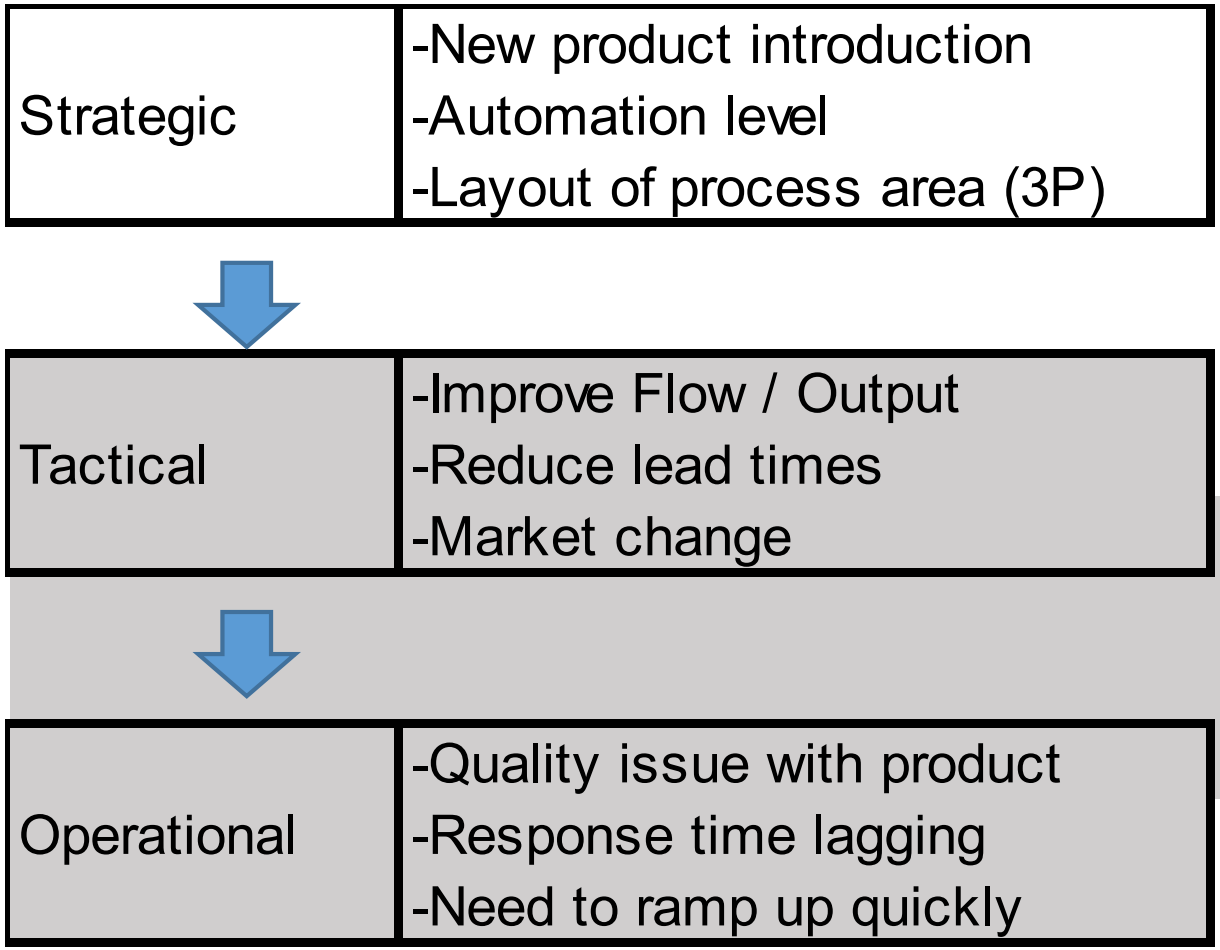
- Medium / Hard problem
- Significant or repetitive complaints
- Repetitive problems occurring during a specific process
- Performance is generally below desired standard

1


Situation?
What is the situation – background, circumstances and effects?
Tools?
Thinking
Interactive
Others?
Who should I involve – others who could help or hinder progress?
Readiness?
How competent, committed, confident and 'able to cope' are they in this situation?
Plan to Involve?
How do I involve others in applying the thinking – interactive tools?
Implement?
How do I take and sustain action?
JOINT PROBLEM SOLVING



Where to Use A3 Method for Problem Solving



Scope of Review for Today

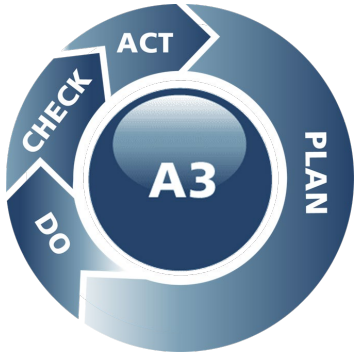
Higher Purpose of A3 Process

Culture Change and Change Management

Communication & Visual Workplace

Planning & Team Building Collaboration (PDAC)

Dual purpose: Solve Problems & Build Problem Solvers



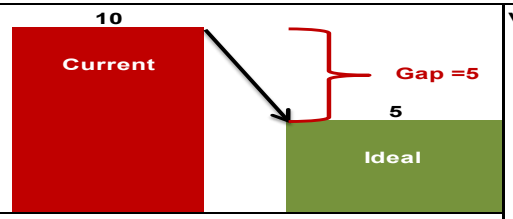
- A3 is just the size of a piece of paper 11 x 17 to make it easy to see and use, transparent, teachable. Logically think through a problem.
- Don't worry about how "Pretty" an A3 is. Hand written is fine
- A3's get revised many times during the process. Some of the best A3's have been passed around, marked up, revised. A3 should prompt healthy debate.
- Promote countermeasures rather than solutions.
- Recognize that every problem does not require an A3.

Rationale/Problem: Write as a problem statement
A good problem statement will include information
about the magnitude of the problem without reference to solutions.

Initiative: _____ **Plant:** _____
Project Owner: _____ **Department:** _____

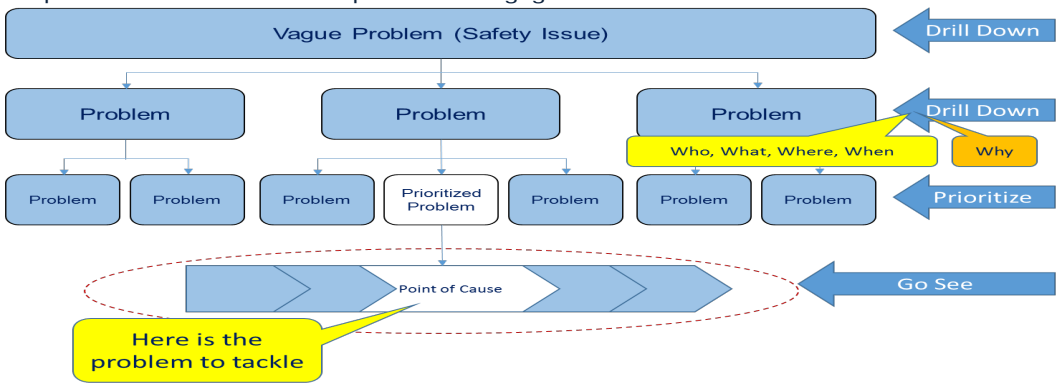
PDCA A3

I. Clarify the Problem:
What is the ultimate goal?
What is the ideal situation?
What is the current situation?
Visualize the gap and make your problem measurable.



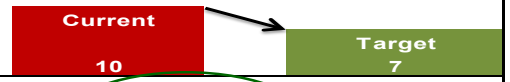
P D C A

II. Break Down The Problem:
Break down the problem into categories.
Narrow the focus to one small problem.
"Go and See" the smaller problem and visualize the process.
Specify the point of cause and state the problem to engage.
Who
What
Where
Why
When

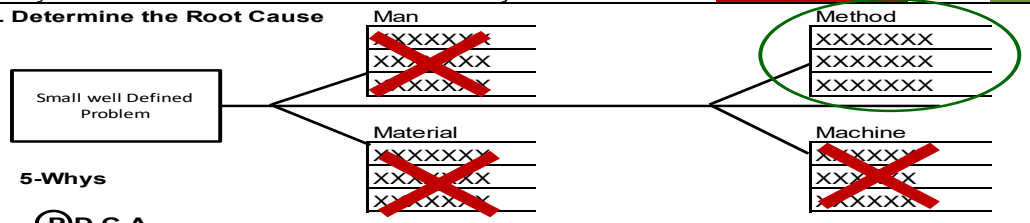


P D C A

III. Set a Target
What is the desired output?
Can it be measured?
How much?
By when? Achieve 3 defect reduction by XX/XX/XXXX



IV. Determine the Root Cause



P D C A

V. Develop Countermeasures:
Develop potential c/m's to address the root cause.
Select the most practical and effective countermeasures.
Build consensus with others.
Create a clear and detailed action plan.

Countermeasure	Safety	Quality	Productivity	Cost
1 Fix Std. Wrk.	Good	Good	Good	Good
2 Buy New Equip.	Good	Good	Good	N/G
3 Hire Another T/M to help	Good	Good	Good	N/G

P D C A

VI. See Countermeasures Through

Scheduled Activities	Resp.	Time Line	Status
XXXXXXX	XXX		Complete
XXXXXXX	XXX		Complete
XXXXXXX	XXX		Past Due
XXXXXXX	XXX		Complete
XXXXXXX	XXX		Complete
XXXXXXX	XXX		Not Due
XXXXXXX	XXX		Not Due

P D C A

VII. Confirm Results and Processes
Evaluate the overall results (compare with step 3)
Understand the factors behind success or failure.

P D C A

VIII. Standardize Successful Countermeasures
Structure processes to prevent reoccurrence.
Share improved processes with others.
Start working on another problem.

P D C A

Signoff by controller and business unit manager required before closure

Project Owner: _____ Controller: _____ Business Unit Mgr.: _____

Date: _____ Date: _____ Date: _____

Rationale/Problem Statement :

PLAN

Title: _____

Date: _____ By: _____ Approval: _____

(1) Clarify the problem:

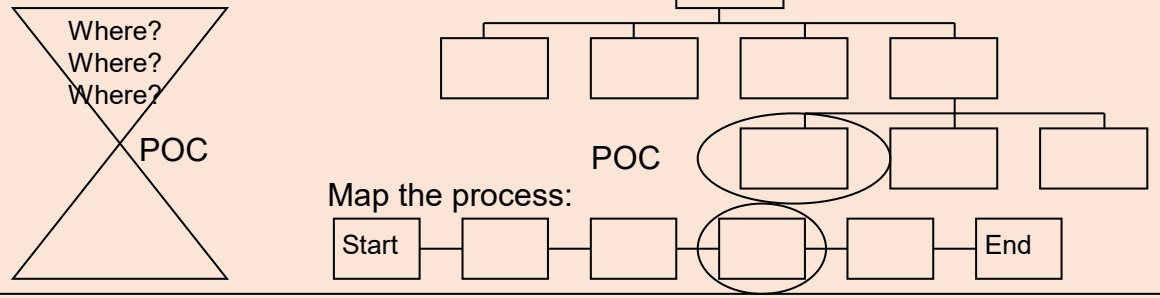
Ultimate goal:

Ideal state:

GAP

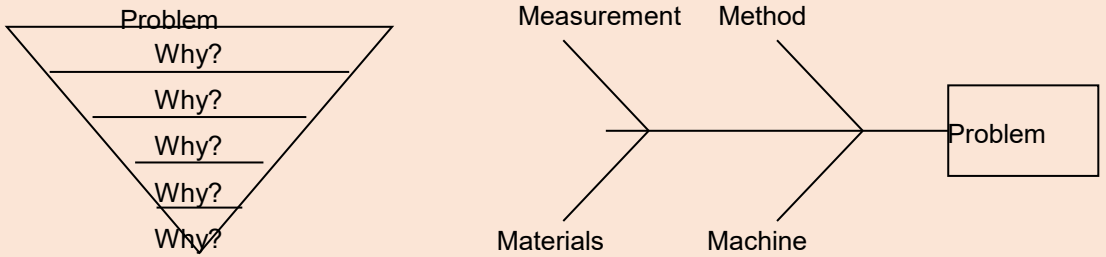
Current state:

(2) Breakdown the problem:



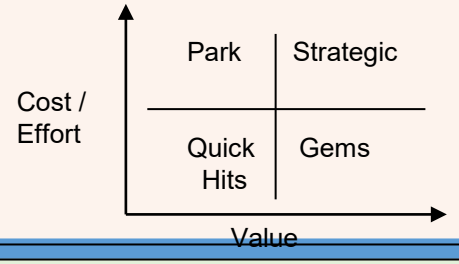
(3) Set Target: (descriptive and numeric)

(4) Analyze the Root Causes:



(5) Develop Solutions / Countermeasures:

Solution	Effect	Cost	Ease



(6) Implement:

DO

Action	Who	Due

(7) Evaluate:

CHECK

- Your Boss's Viewpoint
- Teams Viewpoint
- Your Personal Viewpoint
- Customer's Viewpoint

(8) Standardize: (Yokoten)

ACT

Standard Operating Procedure

Rationale/Problem Statement :

Title: _____

Date: _____ By: _____ Approval: _____

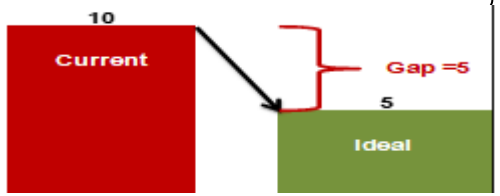
(1) Clarify the problem:

Ultimate goal:

Ideal state:

GAP

Current state:



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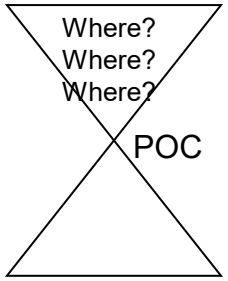

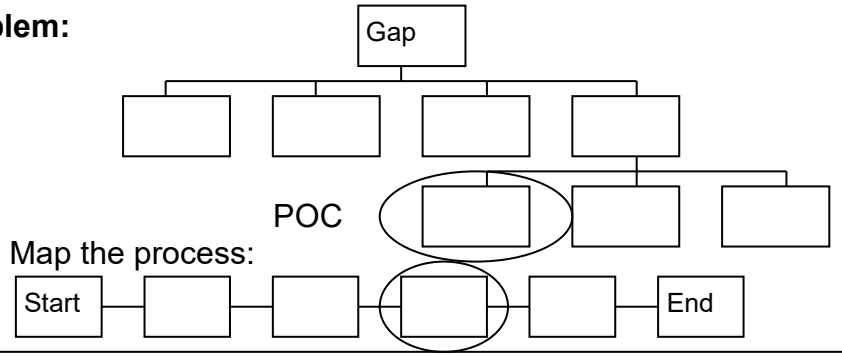

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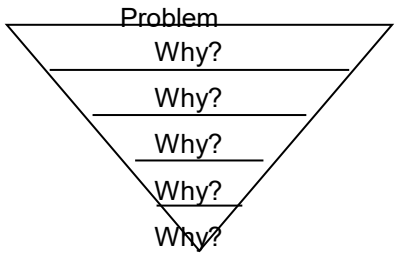

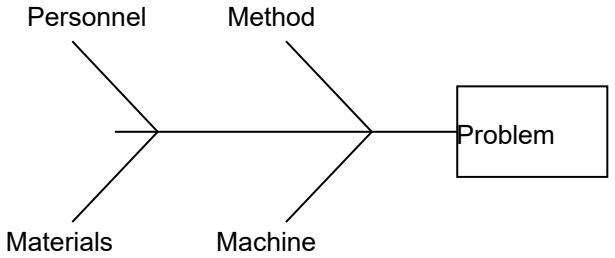

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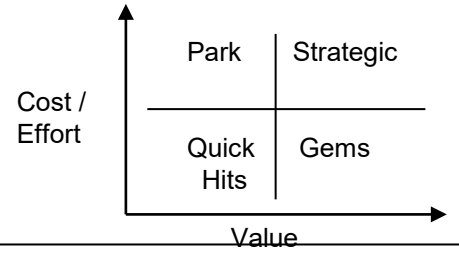
Solution	Effect	Cost	Ease



(6) Implement:

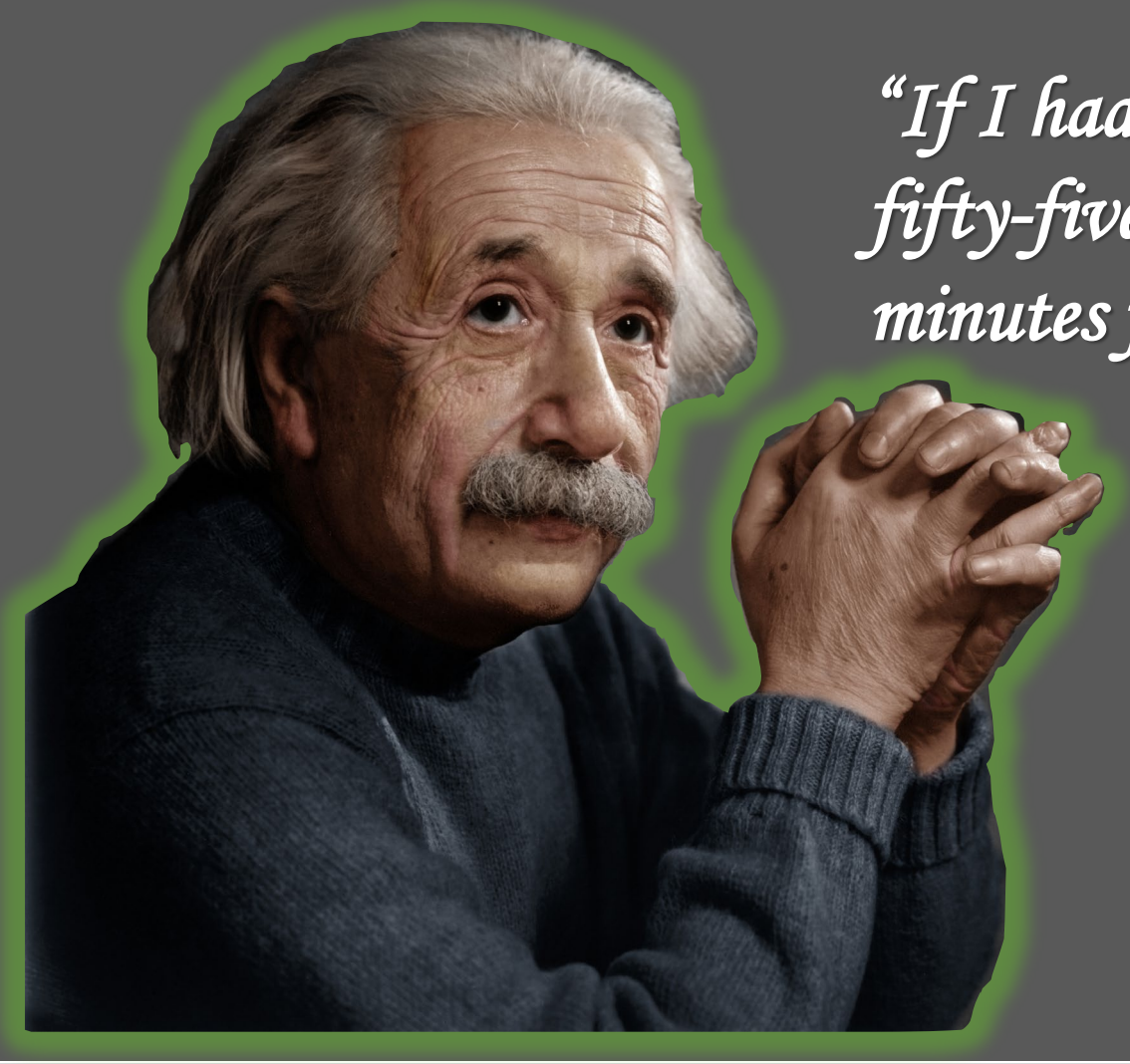
Action	Who	Due

(7) Evaluate:

- Company's Viewpoint
- Teams Viewpoint
- Your Personal Viewpoint
- Customer's Viewpoint

(8) Standardize: (Yokoten)

Standard Operating Procedure



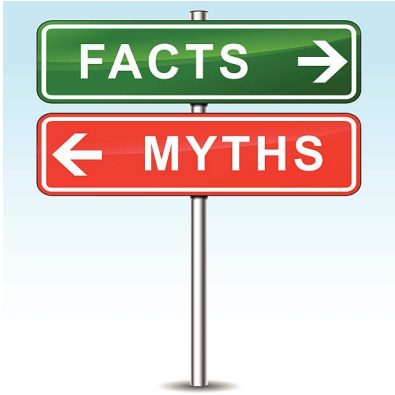
"If I had one hour to save the world, I would spend fifty-five minutes defining the problem and only five minutes finding the solution."

TIME FOR A

BREAK!

Welcome Back!

Problem Statement / Rationale



- Good problem statements state the facts about the problem without stating possible solutions and include specific information:
    - Timeframe when baseline data was taken
    - Location where data was taken
    - Issue of concern / What is wrong
    - Business impact eg: annualized cost to business

Rationale/Problem Statement :

Title: _____

Date: _____ By: _____ Approval: _____

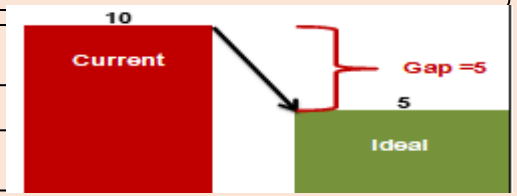
(1) Clarify the problem:

Ultimate goal:

Ideal state:

GAP

Current state:



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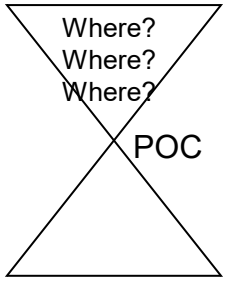
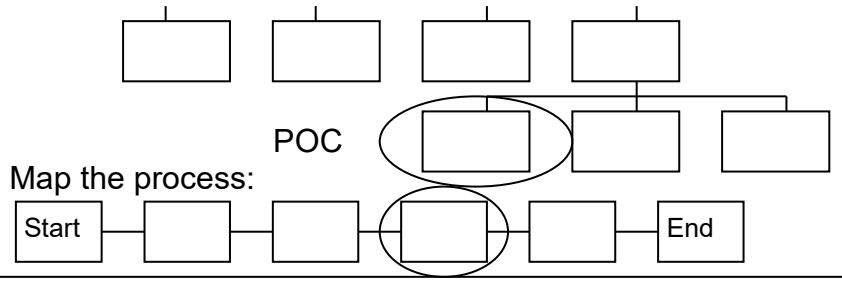
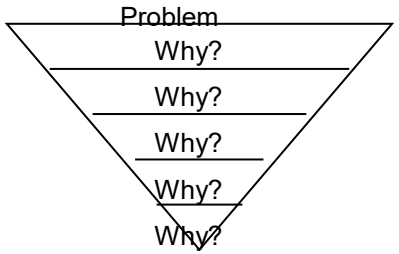
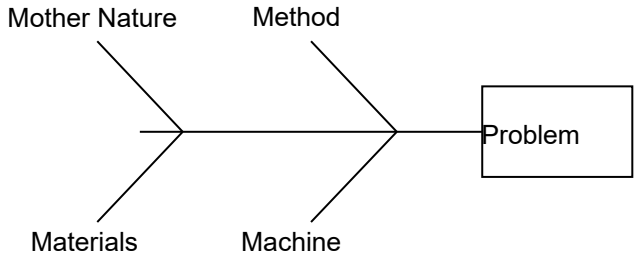




(3) Set Target: (descriptive and numeric)

(4) Analyze the Root Causes:





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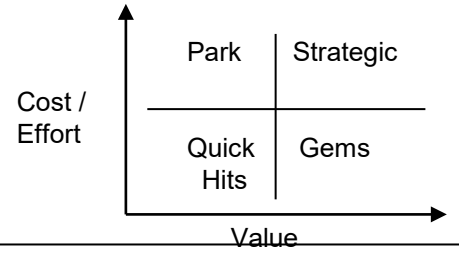
Solution	Effect	Cost	Ease



(6) Implement:

Action	Who	Due

(7) Evaluate:

- Company's Viewpoint
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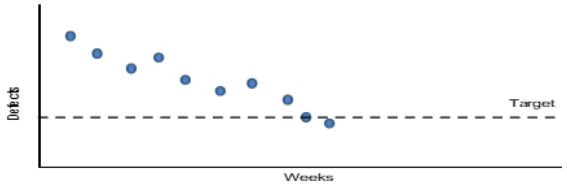
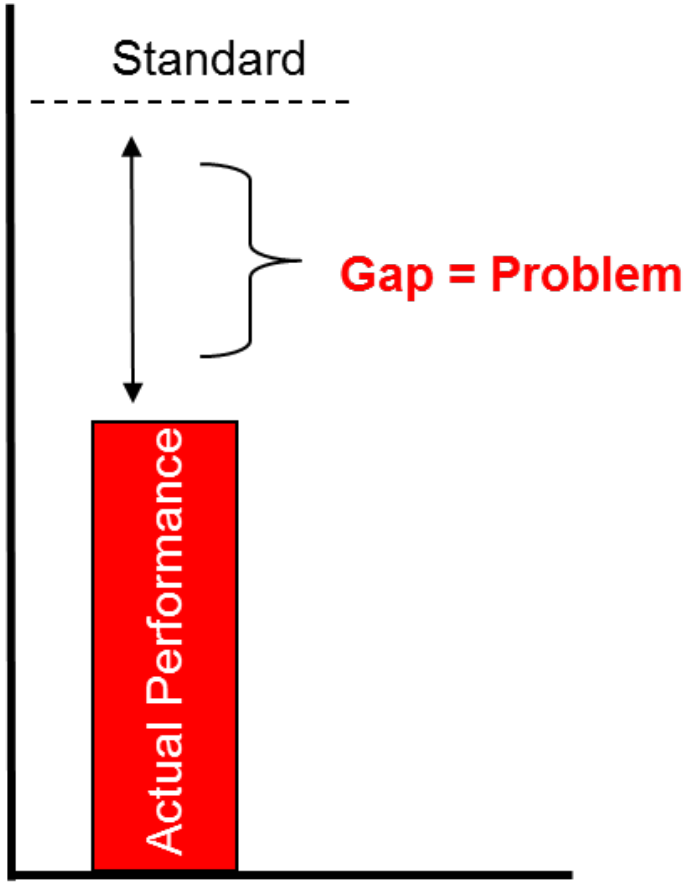
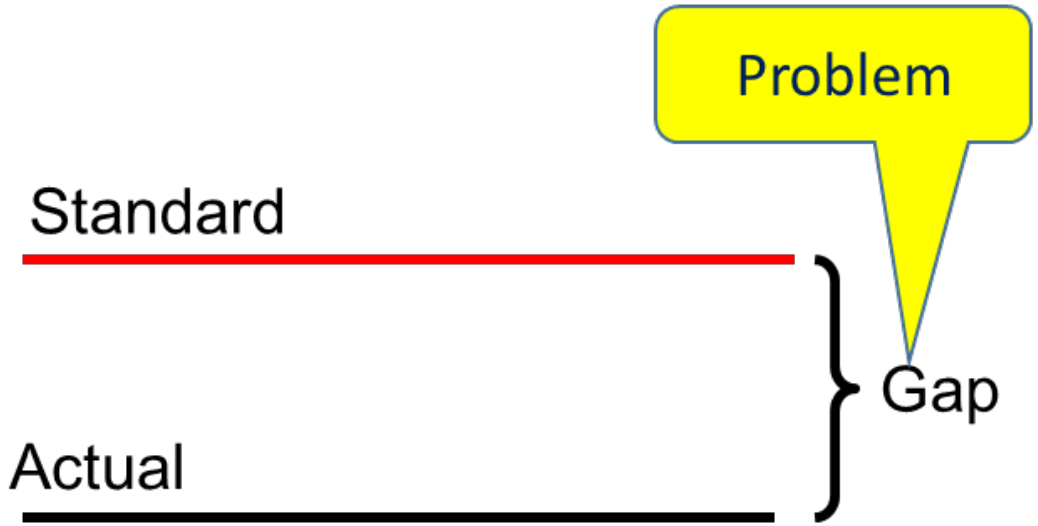


(8) Standardize: (Yokoten)

Standard Operating Procedure

Step 1: Clarify the Problem





- We need to understand the Current Situation (Measured), and Ideal Situation (Standard)
- Why is it a problem?
- What KPI(s) is/are affected?
- What is the cost?
- How does it relate to the Objective?
- Why is it a priority?

Rationale/Problem Statement :

Title: _____

Date: _____ By: _____ Approval: _____

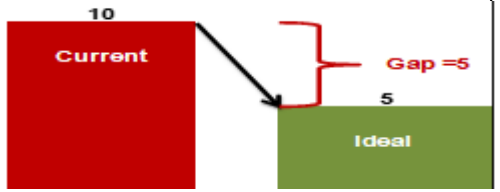
(1) Clarify the problem:

Ultimate goal:

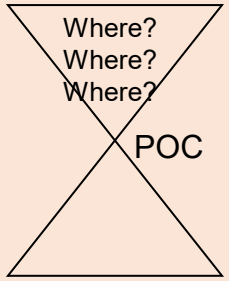
Ideal state:

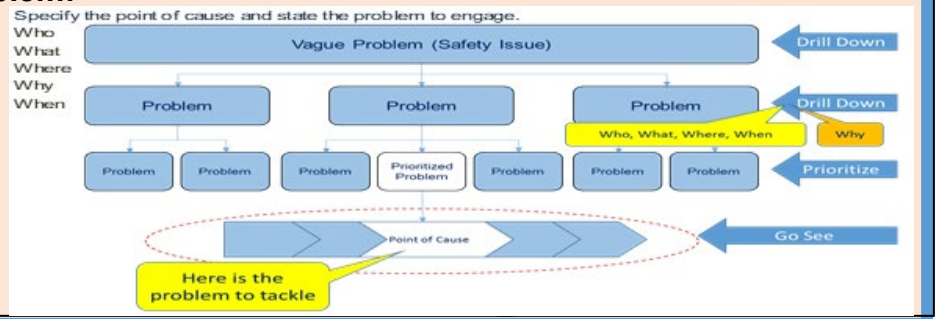
GAP

Current state:



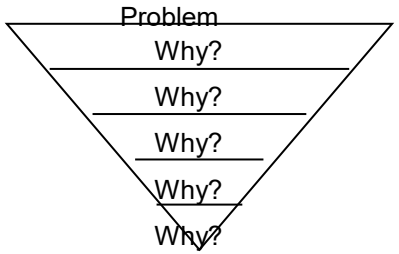
(2) Breakdown problem:

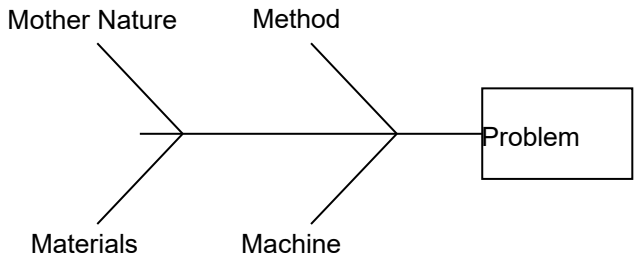




(3) Set Target: (descriptive and numeric)

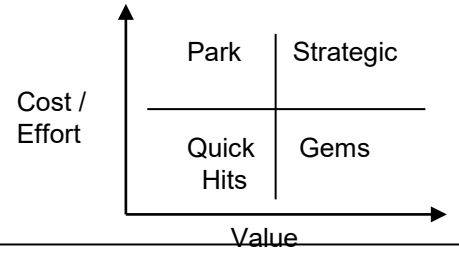
(4) Analyze the Root Causes:





(5) Develop Solutions / Countermeasures:

Solution	Effect	Cost	Ease



(6) Implement:

Action	Who	Due

(7) Evaluate:

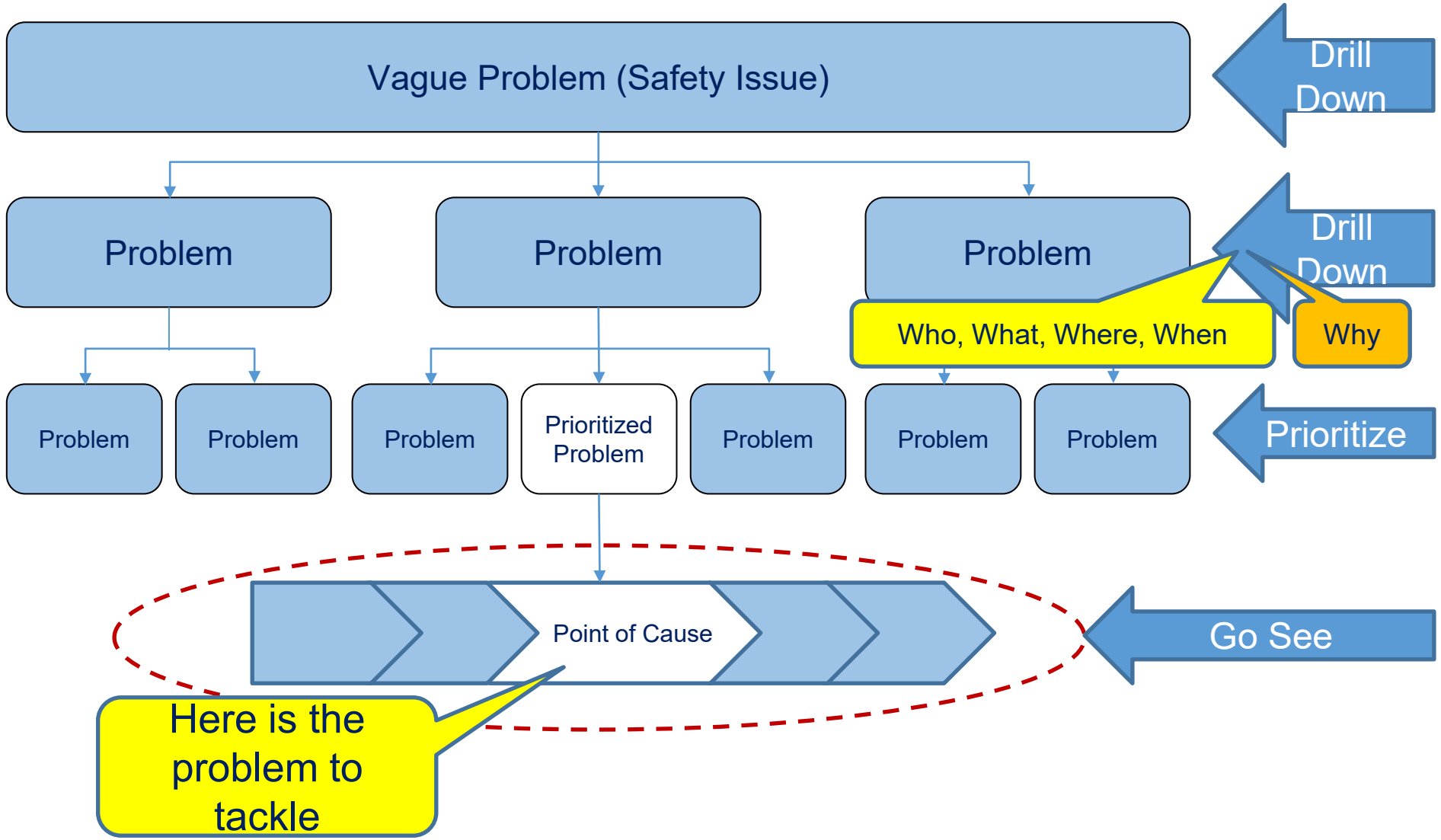
- Company's Viewpoint
- Teams Viewpoint
- Your Personal Viewpoint
- Customer's Viewpoint

(8) Standardize: (Yokoten)

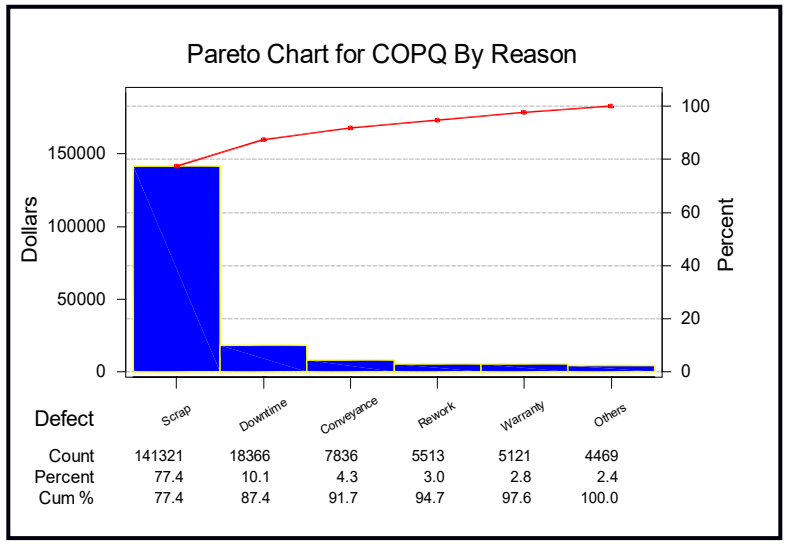
Standard Operating Procedure

Step 2: Break Down the Problem

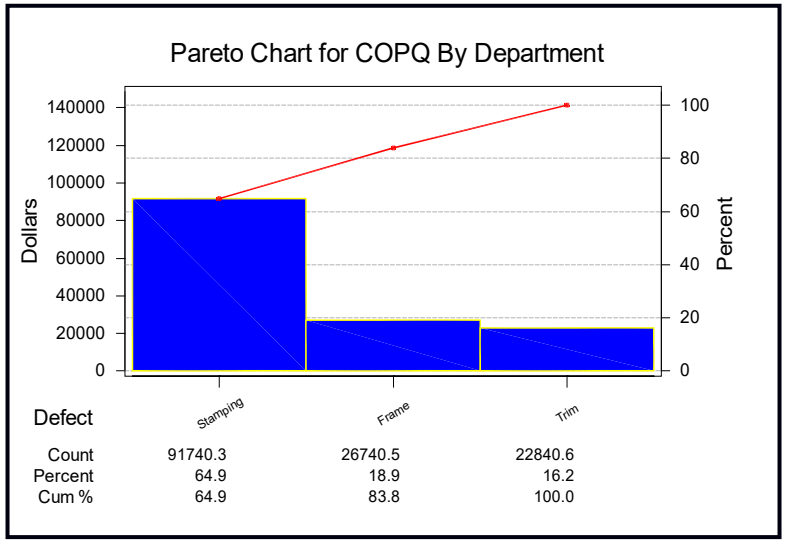
- Break down the problem.
- Narrow the focus.
- "Go to Gemba"
- Process Map
- Specify the point of cause.



The Three-Level Pareto

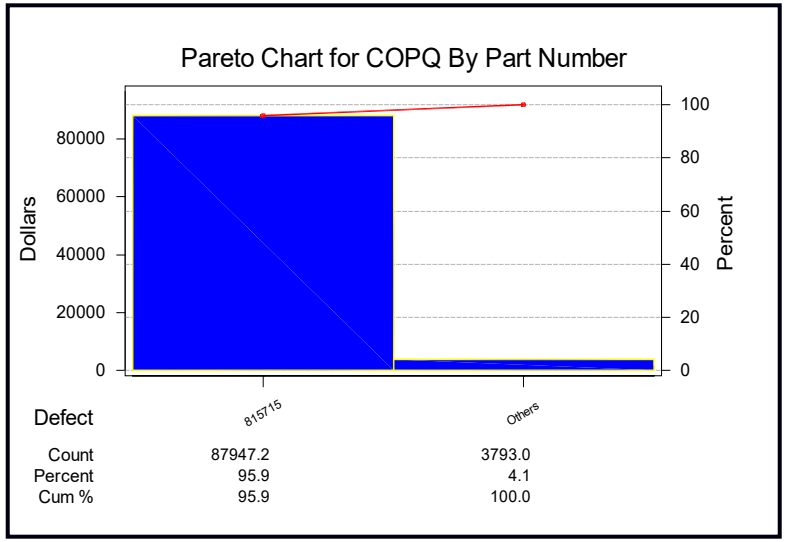


Drill down…..



Drill down…..

Actionable level?…



Step 3: Set the Target

- S.M.A.R.T.
  - Address the issue of the problem statement
  - What you going to improve
  - How much improvement
  - Verify improvement is relevant to business
  - By when
- DO NOT attempt to define a solution
- Intermediate / Realistic Step towards Ideal State

Rationale/Problem Statement :

Title: _____

Date: _____ By: _____ Approval: _____

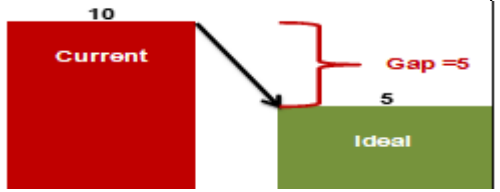
(1) Clarify the problem:

Ultimate goal:

Ideal state:

GAP

Current state:



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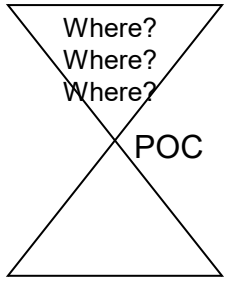
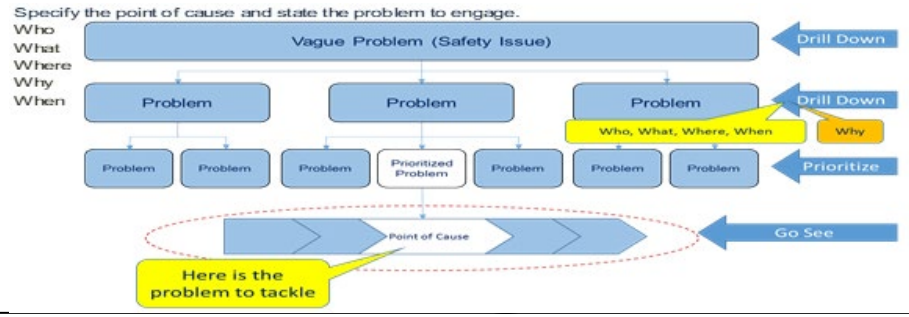
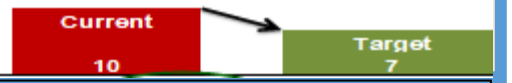




(3) Set Target: (descriptive and numeric)

What is the desired output?
Can it be measured?
How much?
By when? Achieve 3 defect reduction by XX/XX/XXXX



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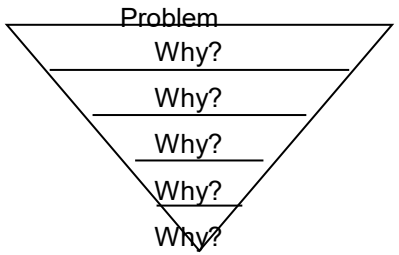

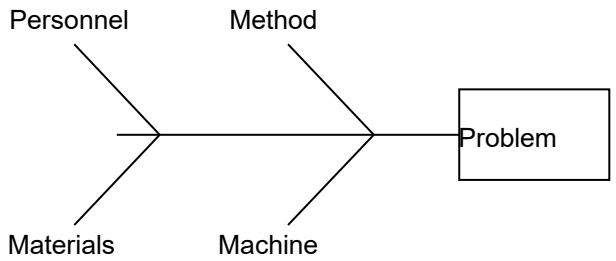

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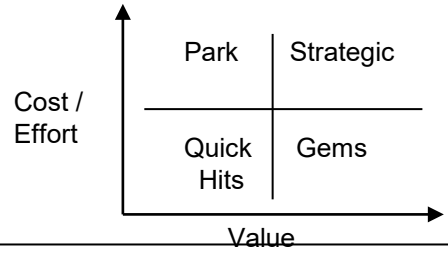
Solution	Effect	Cost	Ease



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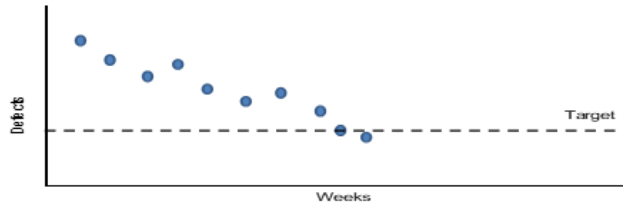
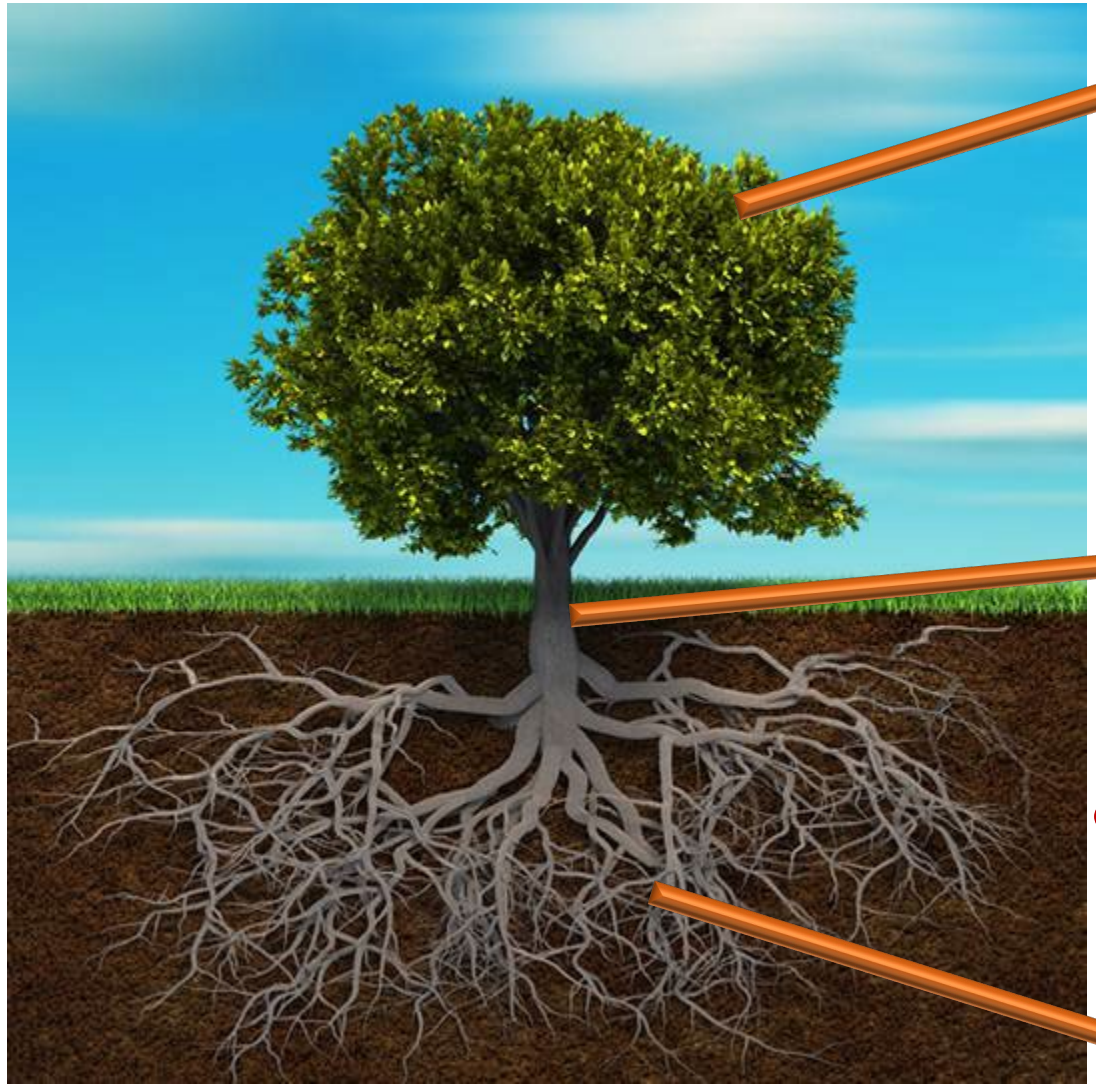


(8) Standardize: (Yokoten)

Standard Operating Procedure

Step 4: Analyze the Root Cause



Observed Symptoms

Containment Action

Fact Gathering & Analysis

Direct Causes

Corrective Action

More Detailed Analysis

Preventive Action

Root Causes

Rationale/Problem Statement :

Title: _____

Date: _____ By: _____ Approval: _____

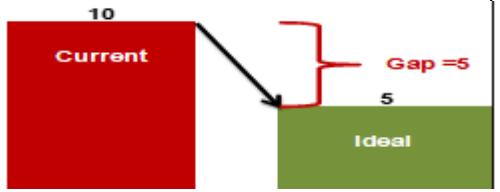
(1) Clarify the problem:

Ultimate goal:

Ideal state:

GAP

Current state:



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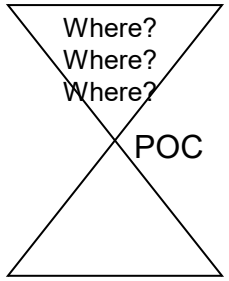

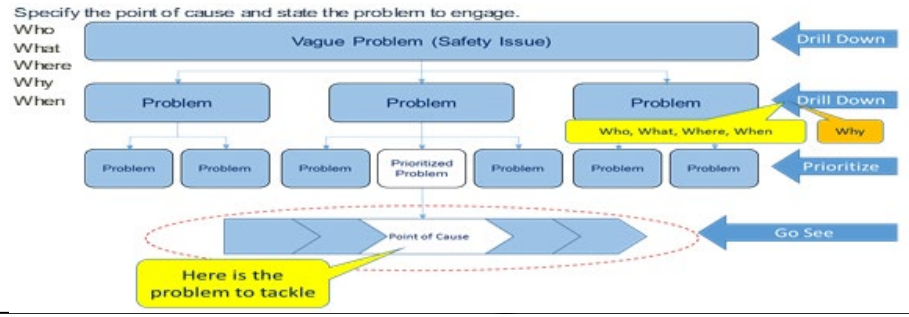

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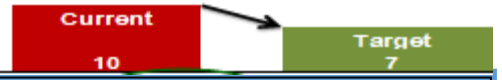

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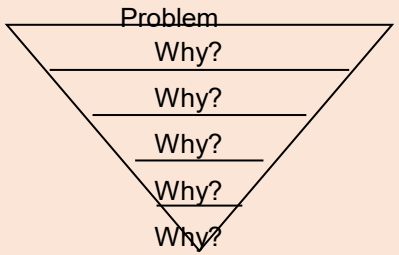

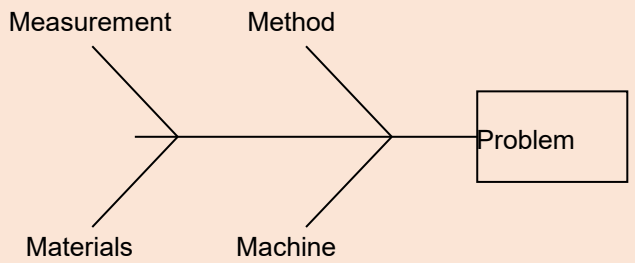

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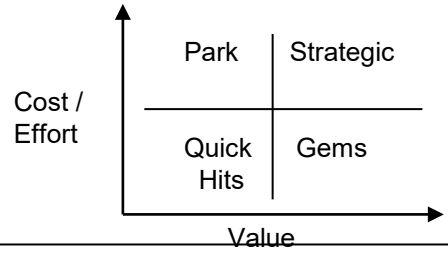
Solution	Effect	Cost	Ease



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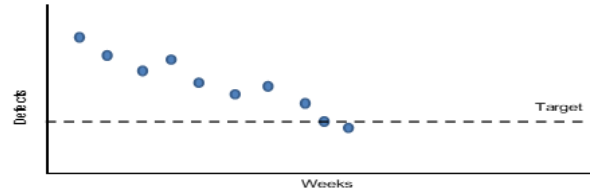


(8) Standardize: (Yokoten)

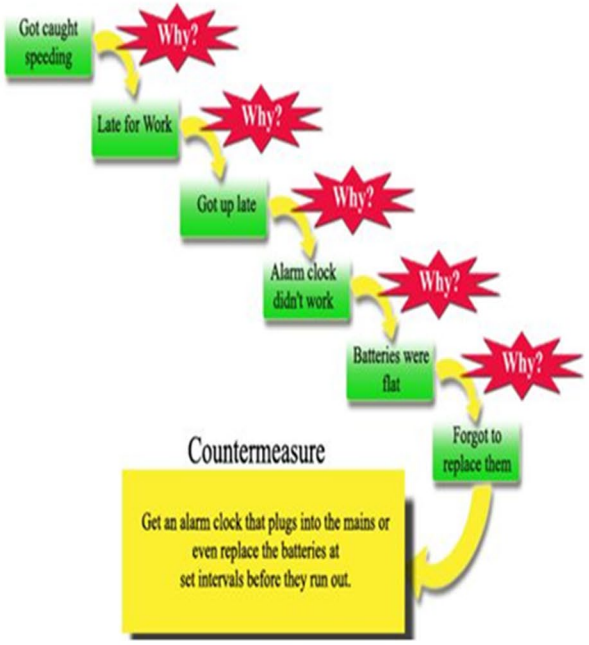
Standard Operating Procedure

Root Cause – 5 Whys

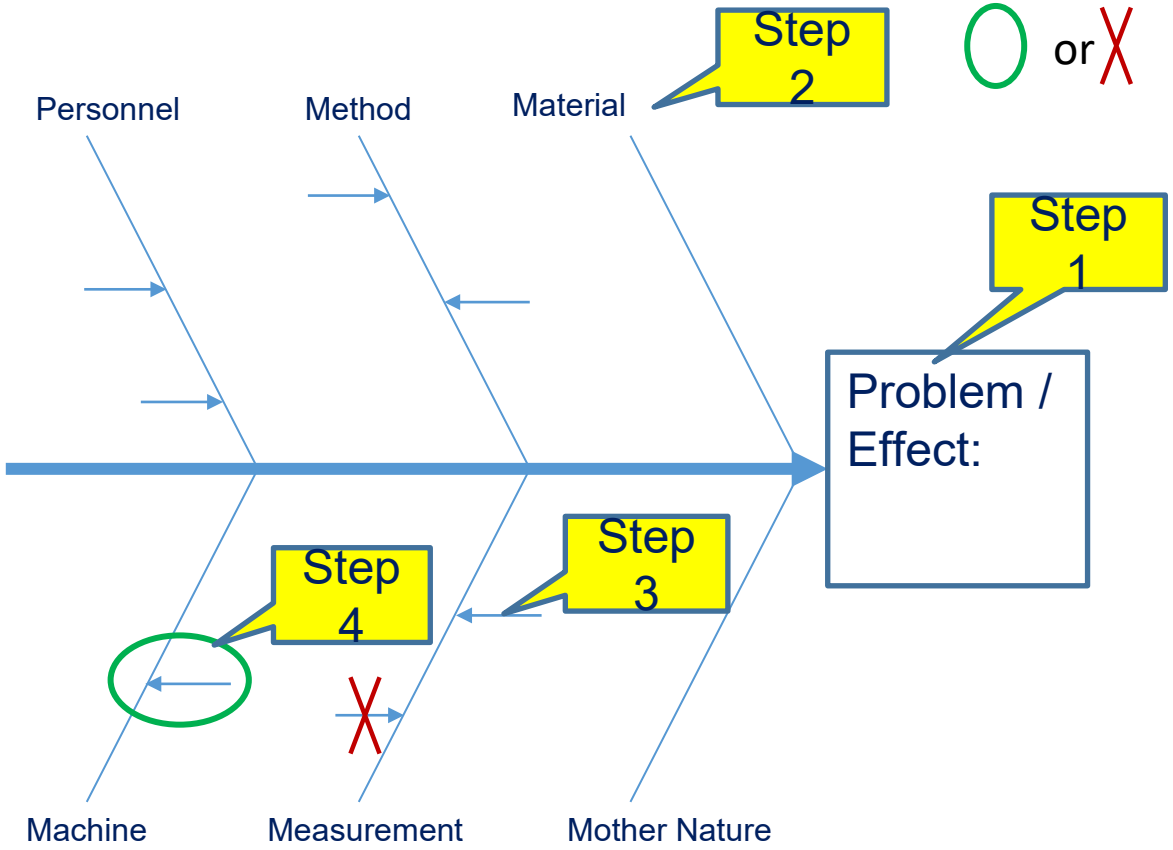
Ask 5 Whys

- Write down the specific problem. Writing the issue helps you formalize the problem and describe it completely. It also helps a team focus on the same problem.
- Ask "Why" the problem happens and write the answer down below the problem.
- If the answer you just provided doesn't identify the **root cause** of the problem that you wrote down in Step 1, ask "Why" again and write that answer down.
- Loop back to step 3 until the team is in agreement that the problem's root cause is identified. Again, this may take fewer or more times than five Whys.

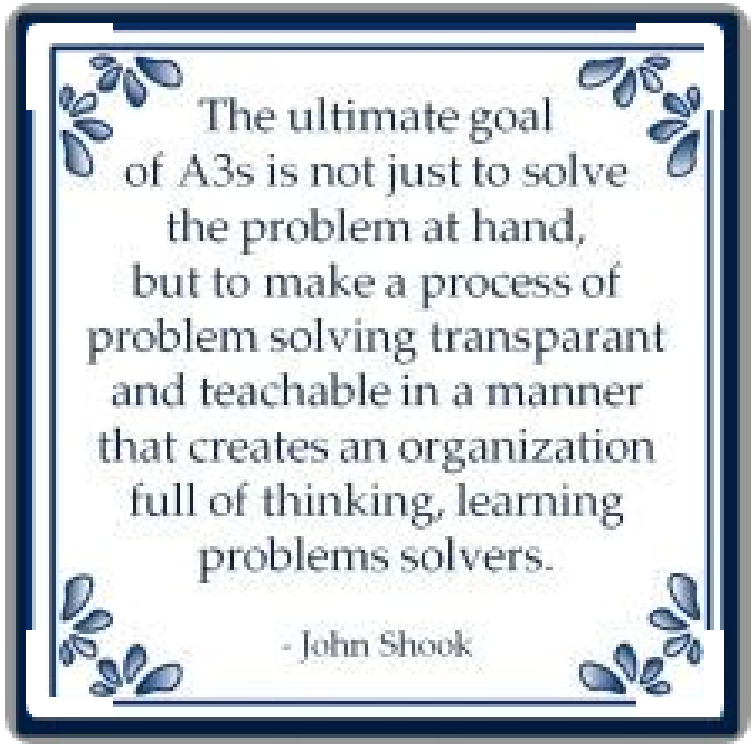
Example

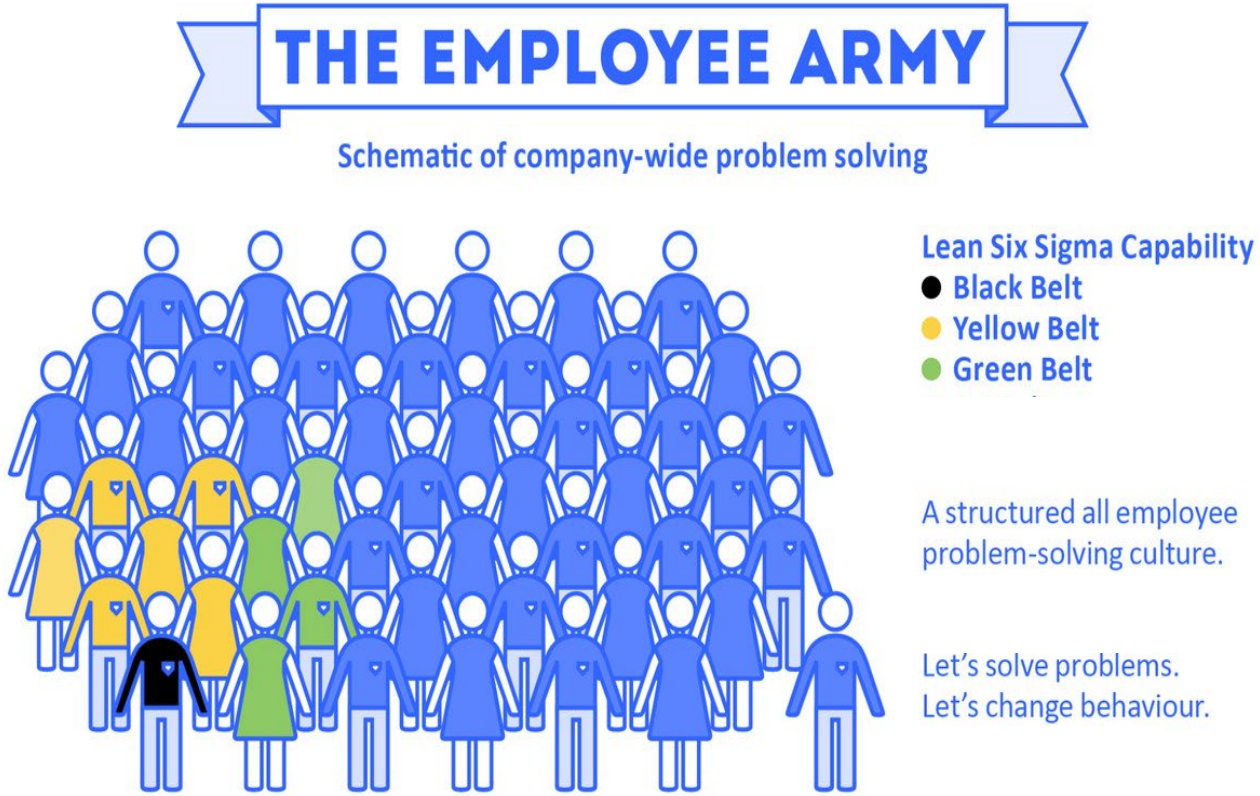


Fishbone (Ishikawa) Diagram



Analyze– Practical





Case Study #1

Background / Problem Statement:

Over the course of two days, an airline placed an unaccompanied minor on the wrong flight on two different occasions. On May 2nd, a child flying alone and under the supervision of the airline was scheduled to fly from Toronto ON to Winnipeg MB. Instead, she ended up in Calgary AB. One day later, a second occurrence with the same airline, this time out of Montreal. Instead of going to Halifax NS, this unaccompanied girl ended up in St.John NB. Very bad media publicity has potential to impact reservations / sales and overall company reputation. Already have seen a spike in reservation cancellations.

Rationale/Problem Statement :

Over the course of two days, an airline placed an unaccompanied minor on the wrong flight on two different occasions. On May 2nd, a child flying alone and under the supervision of the airline was scheduled to fly from Toronto ON to Winnipeg MB. Instead, she ended up in Calgary AB. One day later, a second occurrence with the same airline, this time out of Montreal. Instead of going to Halifax NS, this unaccompanied girl ended up in St.John NB. Very bad media publicity has potential to impact reservations / sales and overall company reputation. Already have seen a spike in reservation cancellations.

(1) Clarify the problem:

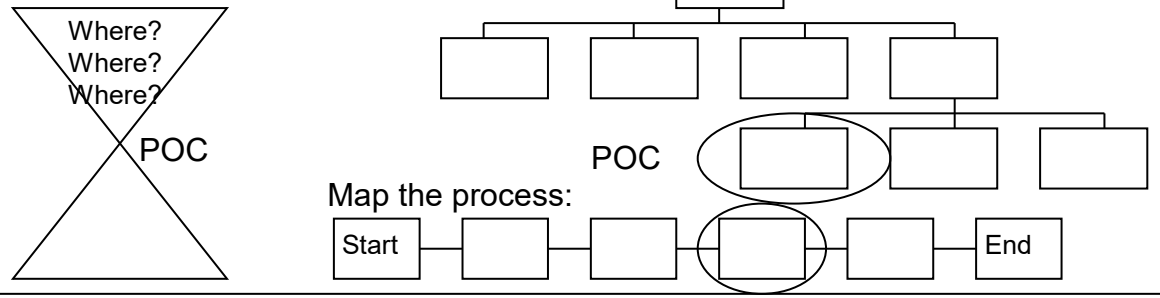
Ultimate goal:

Ideal state:

GAP

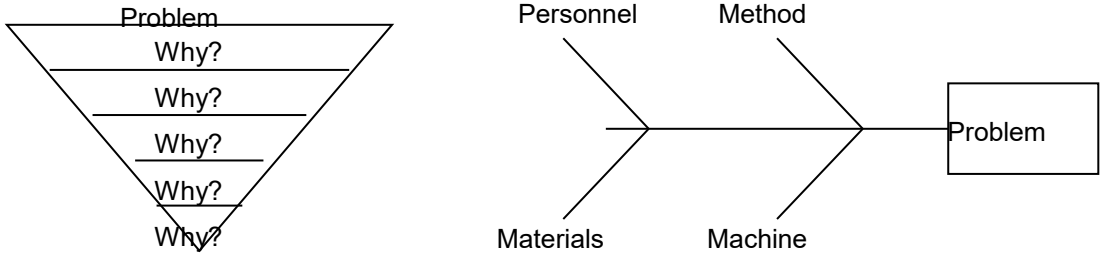
Current state:

(2) Breakdown the problem:



(3) Set Target: (descriptive and numeric)

(4) Analyze the Root Causes:

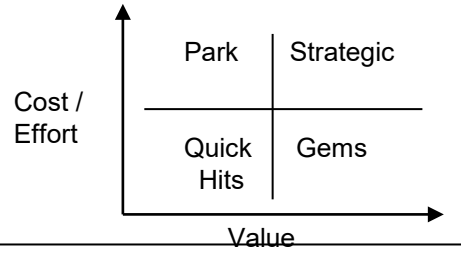


Title: Unaccompanied Minor – Wrong Flight

Date: 15/6 By: J.Doe Approval: C.Harvey

(5) Develop Solutions / Countermeasures:

Solution	Effect	Cost	Ease



(6) Implement:

Action	Who	Due

(7) Evaluate:

- Company's Viewpoint
- Teams Viewpoint
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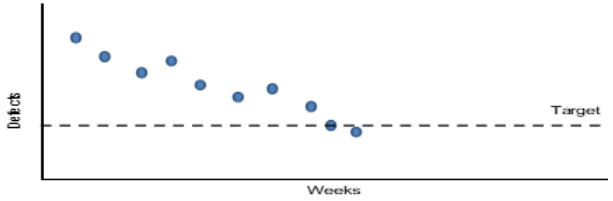


(8) Standardize: (Yokoten)

Standard Operating Procedure

Clarify - Ultimate Goal

Ultimate Goal:

- Not necessarily realistic at this time
- May be far fetched
- Future goal and standard

Purpose:

- Trigger creative thinking
- Help push the limits of “the possible”

Clarify - Ideal State = Current Standard

Ideal State:

- Current Standard or Expectation
- How things should work after the problem is solved
- Considers real barriers and timelines

Purpose:

- Helps with focus
- Makes it real but challenging
- Used to determine GAP

Clarify - Current State = Actual Performance

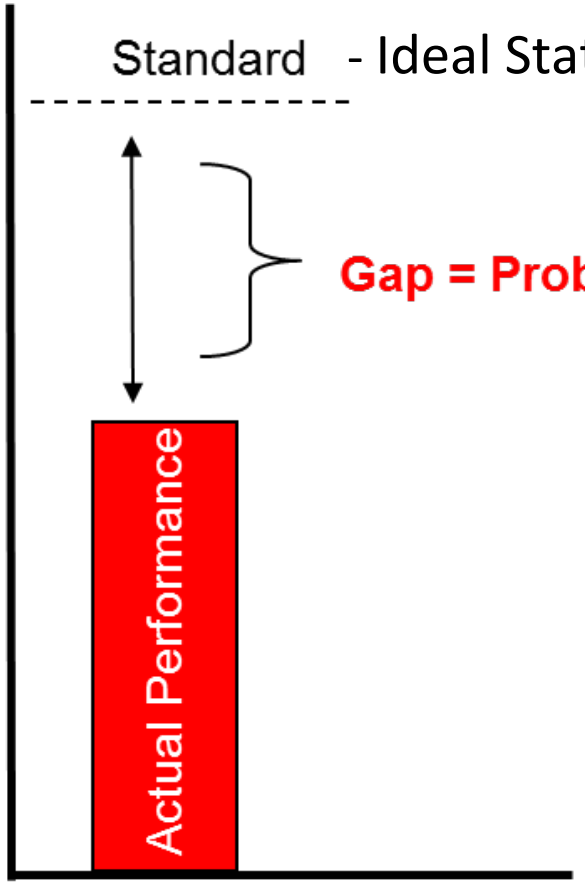
Current State:

- Where we are today
- What really is happening
- Actual measured data / performance

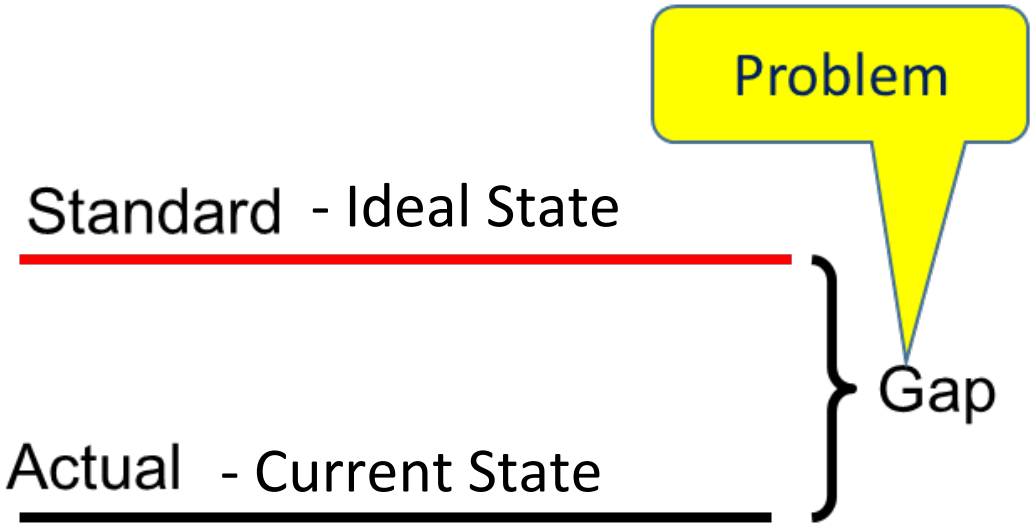
Purpose:

- Team to understand and agree this is current state
- Team alignment, discussion

Gap


Standard - Ideal State
Gap = Problem
Actual Performance

SAG


Problem
Standard - Ideal State
Gap
Actual - Current State

Group Session

You have 7 minutes

You have 7 minutes to:

- Discuss and define Actual Performance / Current State (2 minutes)
- Discuss and define the Ideal State (what should be the current standard and expectation) (2 minutes)
- Define problem to be solved IE: the GAP between Actual and Ideal (2 minute)
- Discuss and define an Ultimate Goal
  - Be creative, think about a future possibility (1 minutes)
- Assign a spokesperson to present …

Clarify – Case Study

Ultimate Goal:

Minors have a dedicated caregiver travel with them to ensure safe travel

Ideal State:

Process ensures unaccompanied minors are placed on the correct flight.

Current State:

Airline is putting unaccompanied minors (UM) onto the wrong flight.

Gap:

UM's put on wrong flights.

Rationale/Problem Statement:

Over the course of two days, an airline placed an unaccompanied minor on the wrong flight on two different occasions. On May 2nd, a child flying alone and under the supervision of the airline was scheduled to fly from Toronto ON to Winnipeg MB. Instead, she ended up in Calgary AB. One day later, a second occurrence with the same airline, this time out of Montreal. Instead of going to Halifax NS, this unaccompanied girl ended up in St.John NB. Very bad media publicity has potential to impact reservations / sales and overall company reputation. Already have seen a spike in reservation cancellations.

(1) Clarify the problem:

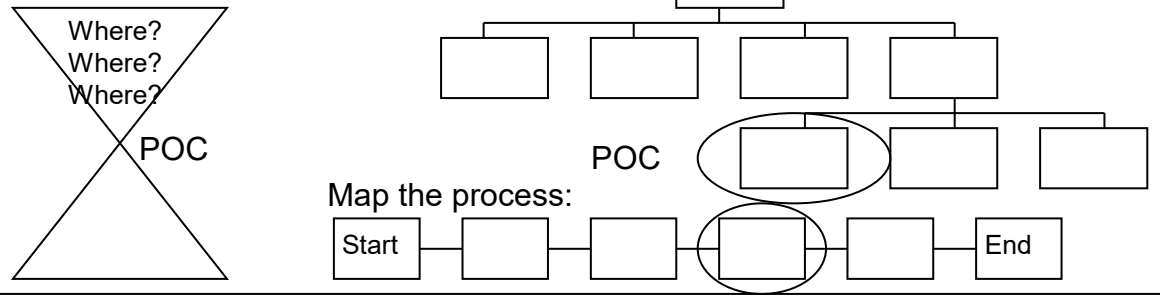
Ultimate goal: Minors have a dedicated caregiver travel with them to ensure safe travel

Ideal state: Process ensures unaccompanied minors are placed on the correct flight

GAP: UM's put on wrong flights

Current state: Airline is putting unaccompanied minors onto the wrong flights

(2) Breakdown the problem:



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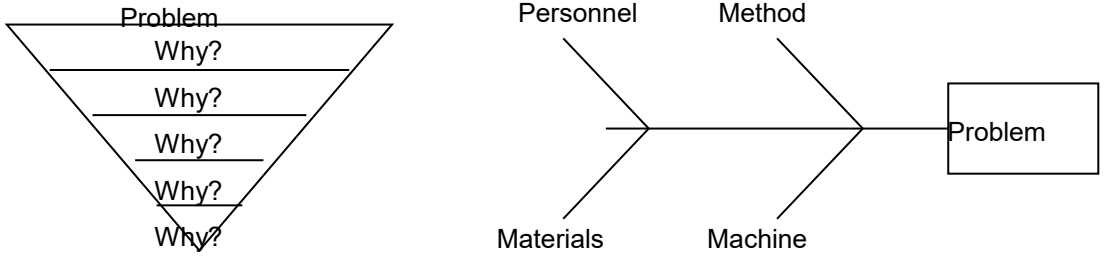

Title: Unaccompanied Minor – Wrong Flight

Date: 15/6 By: J.Doe Approval: C.Harvey

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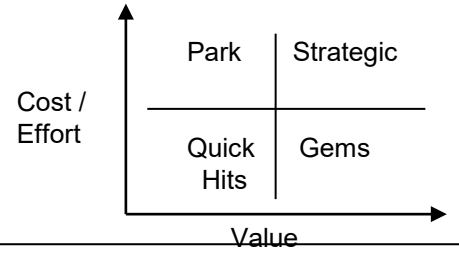
Solution	Effect	Cost	Ease



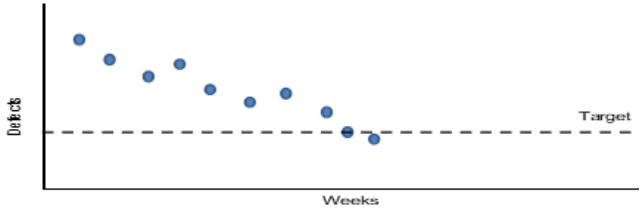
(6) Implement:

UM's put on wrong flights

Action	Who	Due

(7) Evaluate:

- Company's Viewpoint
- Teams Viewpoint
- Your Personal Viewpoint
- Customer's Viewpoint



(8) Standardize: (Yokoten)

Standard Operating Procedure

Breakdown – Theory

Point Of Cause:

Need to find the WHY, WHO, WHAT, WHERE, WHEN

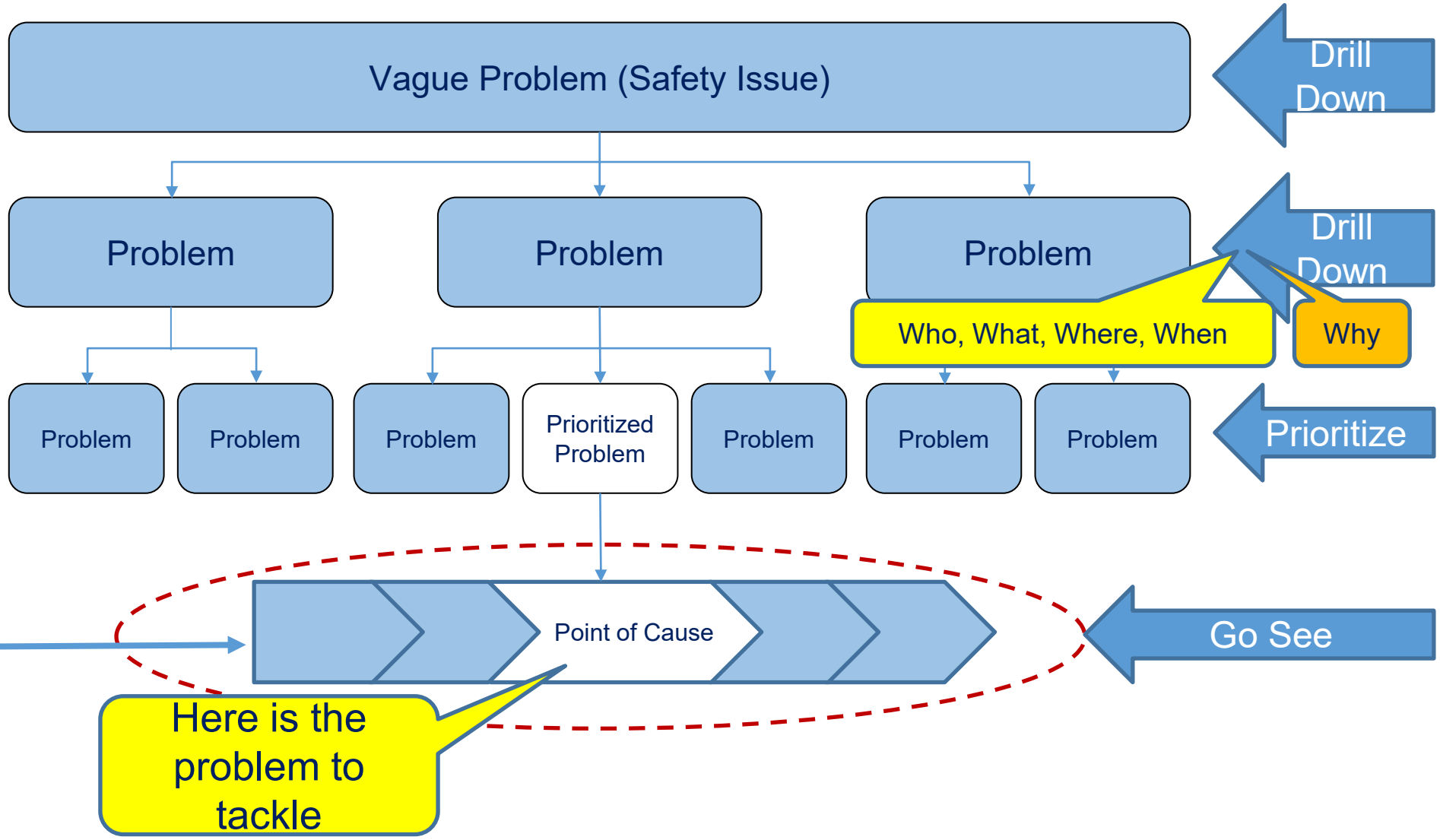
Problems not solved in the boardroom. Go To Gemba. Often.

Use Your Tools ! Drill down to find problems, Process Map, etc

Purpose:

Refines the focus to give the best results for effort

- Break down the problem.
- Narrow the focus. What do we know, W5
- “Go and See”.
- Process Map
- Specify the point of cause.



Group Session

You have
14 minutes

You have 14 minutes to:

- Go to Gemba and gather information from the staff who work at the Gates (4 minutes)
- Discuss and breakdown / drilldown from the GAP to identify at least three (3) narrowed focus problems. (5 minutes)
- Based on prior discussion & using process maps identify potential POC's (5 minutes)
- Assign a spokesperson to present …

Rationale/Problem Statement:

On June 13th, a child flying alone and under the supervision of the airline was scheduled to fly from Houston to Charlotte. Instead, she ended up in Fayetteville. One day later, a second occurrence with the same airline, this time out of Boston. Instead of going to Cleveland, this unaccompanied girl ended up in Newark, NJ. Very bad media publicity has potential to impact reservations / sales and overall company reputation. Already have seen a spike in cancellations.

Title: Unaccompanied Minor – Wrong Flight

Date: 15/6 By: J.Doe Approval: C.Harvey

(1) Clarify the problem:

Ultimate goal: Minors have a dedicated caregiver travel with them to ensure safe travel

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GAP: UM's put on wrong flights

Current state: Airline is putting unaccompanied minors onto the wrong flights

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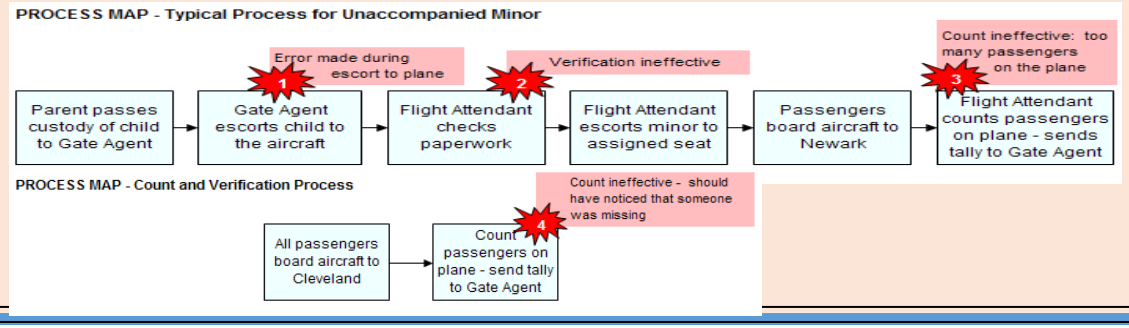

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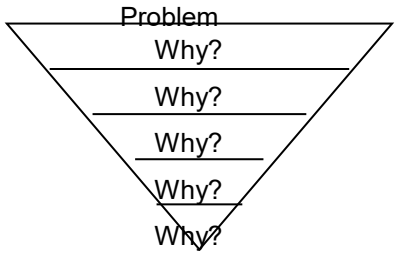
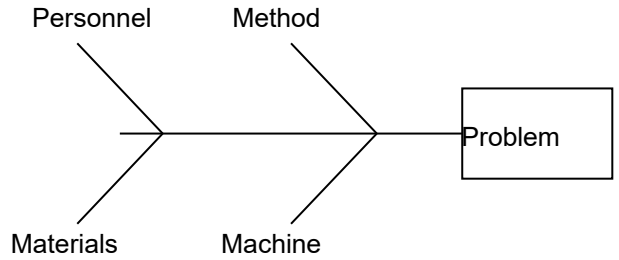
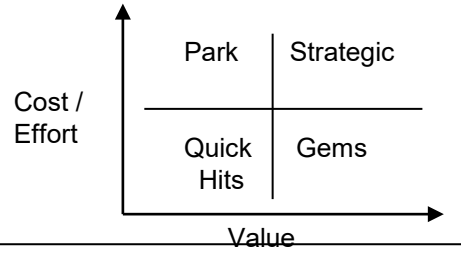
(4) Analyze the Root Causes:





(5) Develop Solutions / Countermeasures:

Solution	Effect	Cost	Ease



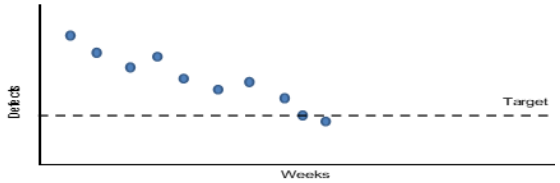
(6) Implement:

UM's put on wrong flights

Action	Who	Due

(7) Evaluate:

- Company's Viewpoint
- Teams Viewpoint
- Your Personal Viewpoint
- Customer's Viewpoint

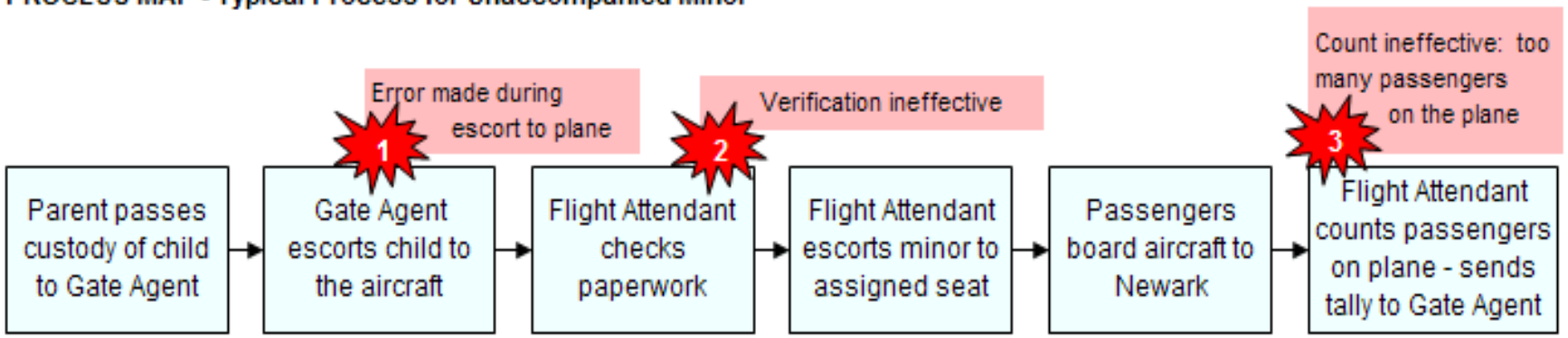


(8) Standardize: (Yokoten)

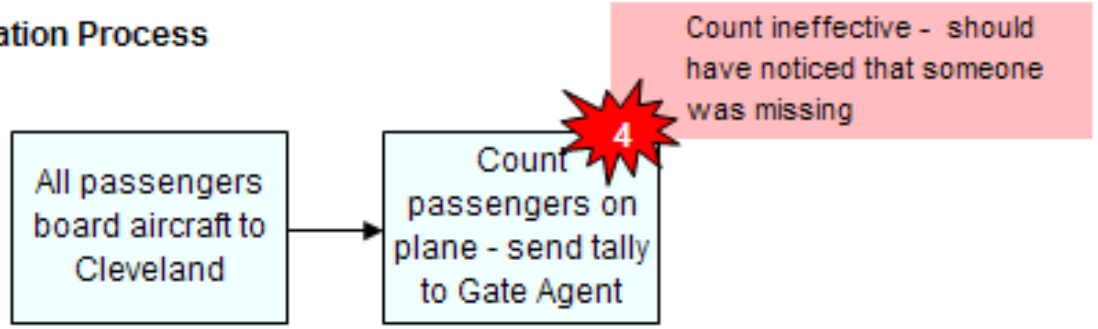
Standard Operating Procedure

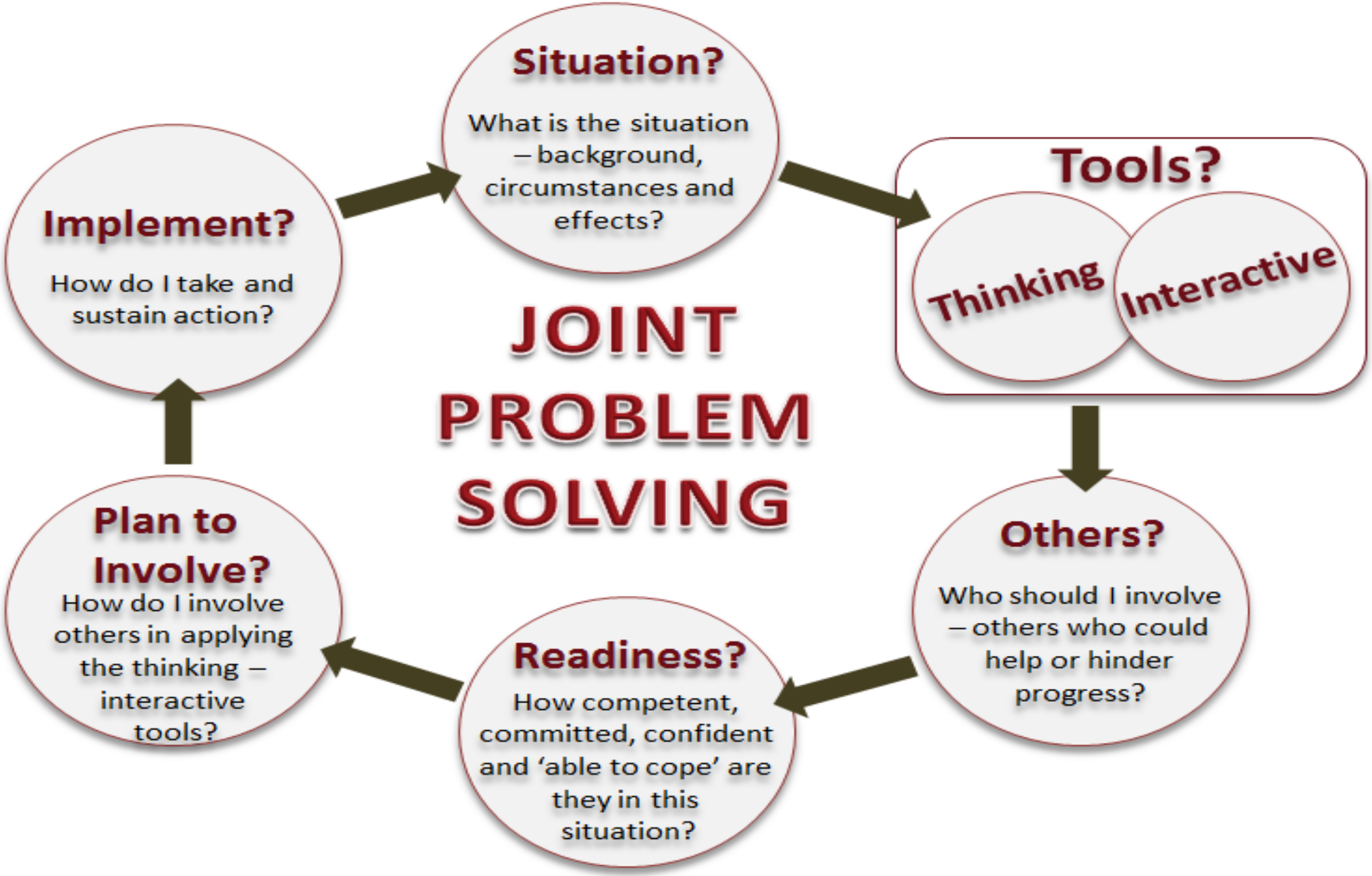
Breakdown – Update

PROCESS MAP - Typical Process for Unaccompanied Minor



PROCESS MAP - Count and Verification Process




Situation?
What is the situation – background, circumstances and effects?
Tools?
Thinking
Interactive
Others?
Who should I involve – others who could help or hinder progress?
Readiness?
How competent, committed, confident and 'able to cope' are they in this situation?
Plan to Involve?
How do I involve others in applying the thinking – interactive tools?
Implement?
How do I take and sustain action?
JOINT PROBLEM SOLVING

Rationale/Problem Statement:

Over the course of two days, an airline placed an unaccompanied minor on the wrong flight on two different occasions. On May 2nd, a child flying alone and under the supervision of the airline was scheduled to fly from Toronto ON to Winnipeg MB. Instead, she ended up in Calgary AB. One day later, a second occurrence with the same airline, this time out of Montreal. Instead of going to Halifax NS, this unaccompanied girl ended up in St.John NB. Very bad media publicity has potential to impact reservations / sales and overall company reputation. Already have seen a spike in reservation cancellations.

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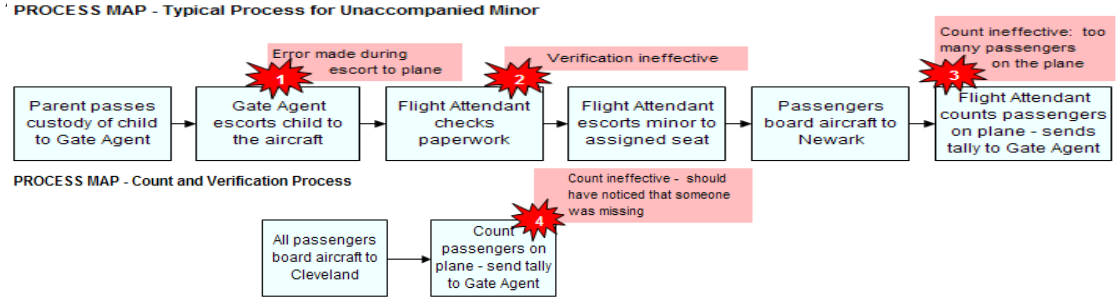

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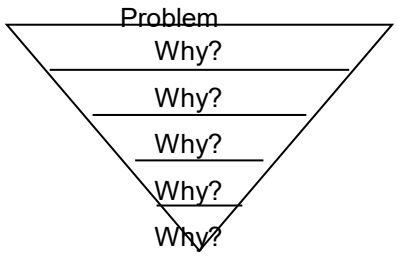

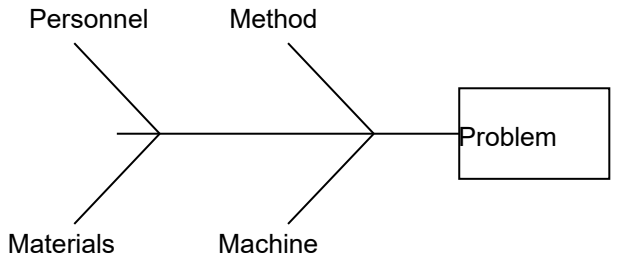

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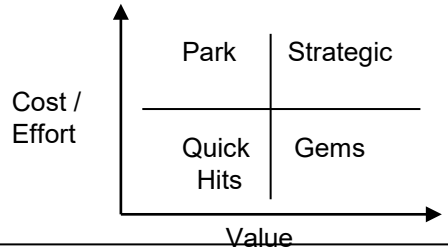

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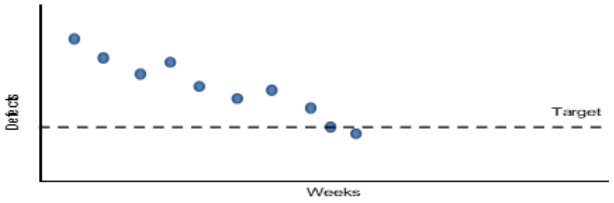

(8) Standardize: (Yokoten)

Standard Operating Procedure

Target – Theory

- Focuses on the possible improvement to the gap (difference between the current and ideal states)
- Time based
- Quantitative: Measurable
- Qualitative: Descriptive

Purpose:

- Continues to refine focus
- Give the team something to aim for

Rationale/Problem Statement:

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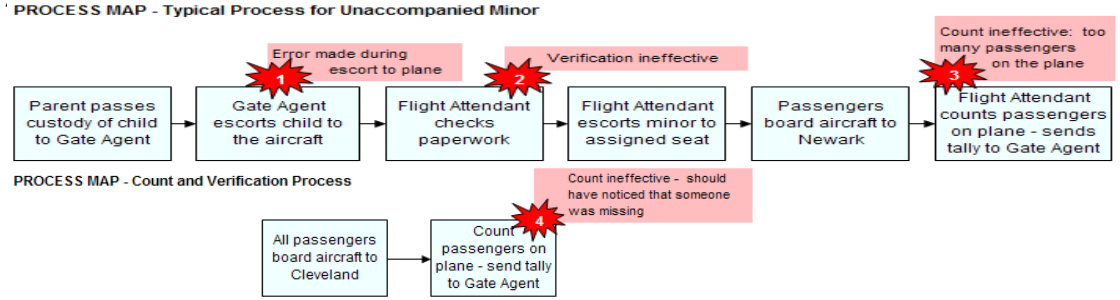

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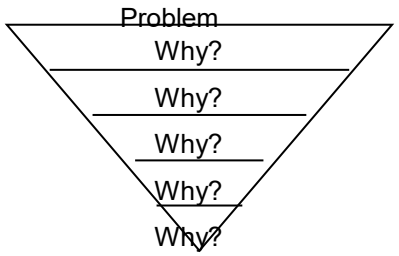

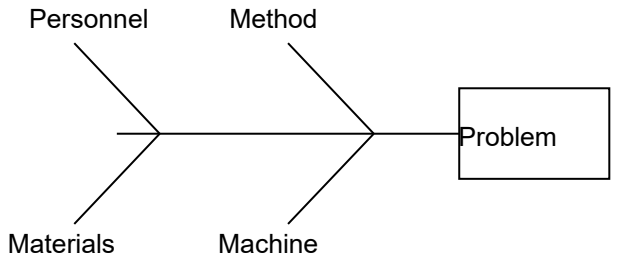

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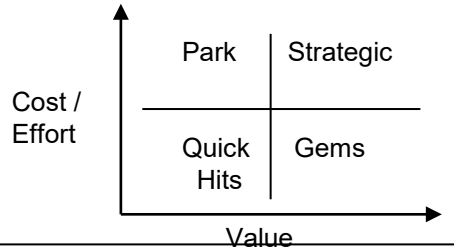

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Action	Who	Due

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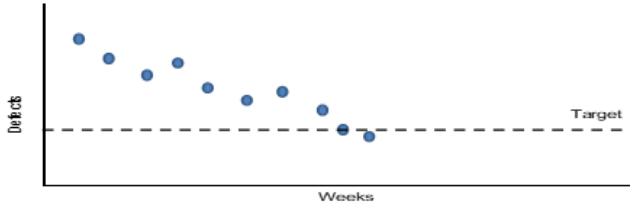


(8) Standardize: (Yokoten)

Standard Operating Procedure

Review

- Problem defined and Gap identified
- Process steps determined by ‘going to Gemba’ and mapping out process
- Multiple POC identified
- Target for improvement set
- Still in Plan phase with two more steps to do

TIME FOR A

BREAK!

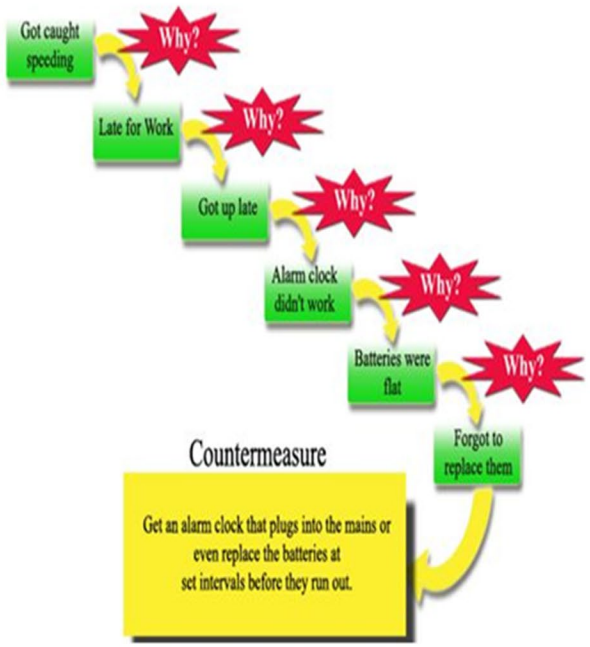
Step 4: Analyze the Root Cause

Root Cause – 5 Whys

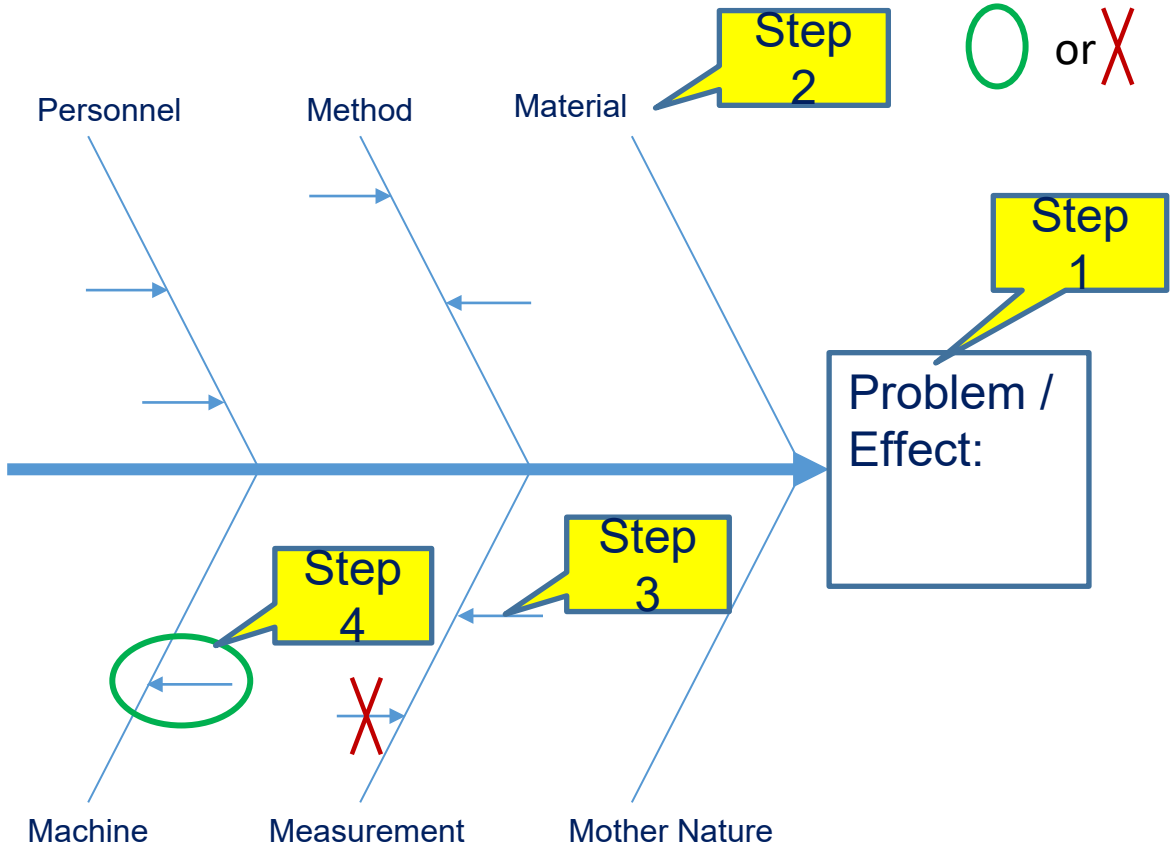
Ask 5 Whys

- Write down the specific problem. Writing the issue helps you formalize the problem and describe it completely. It also helps a team focus on the same problem.
- Ask "Why" the problem happens and write the answer down below the problem.
- If the answer you just provided doesn't identify the **root cause** of the problem that you wrote down in Step 1, ask "Why" again and write that answer down.
- Loop back to step 3 until the team is in agreement that the problem's root cause is identified. Again, this may take fewer or more times than five Whys.

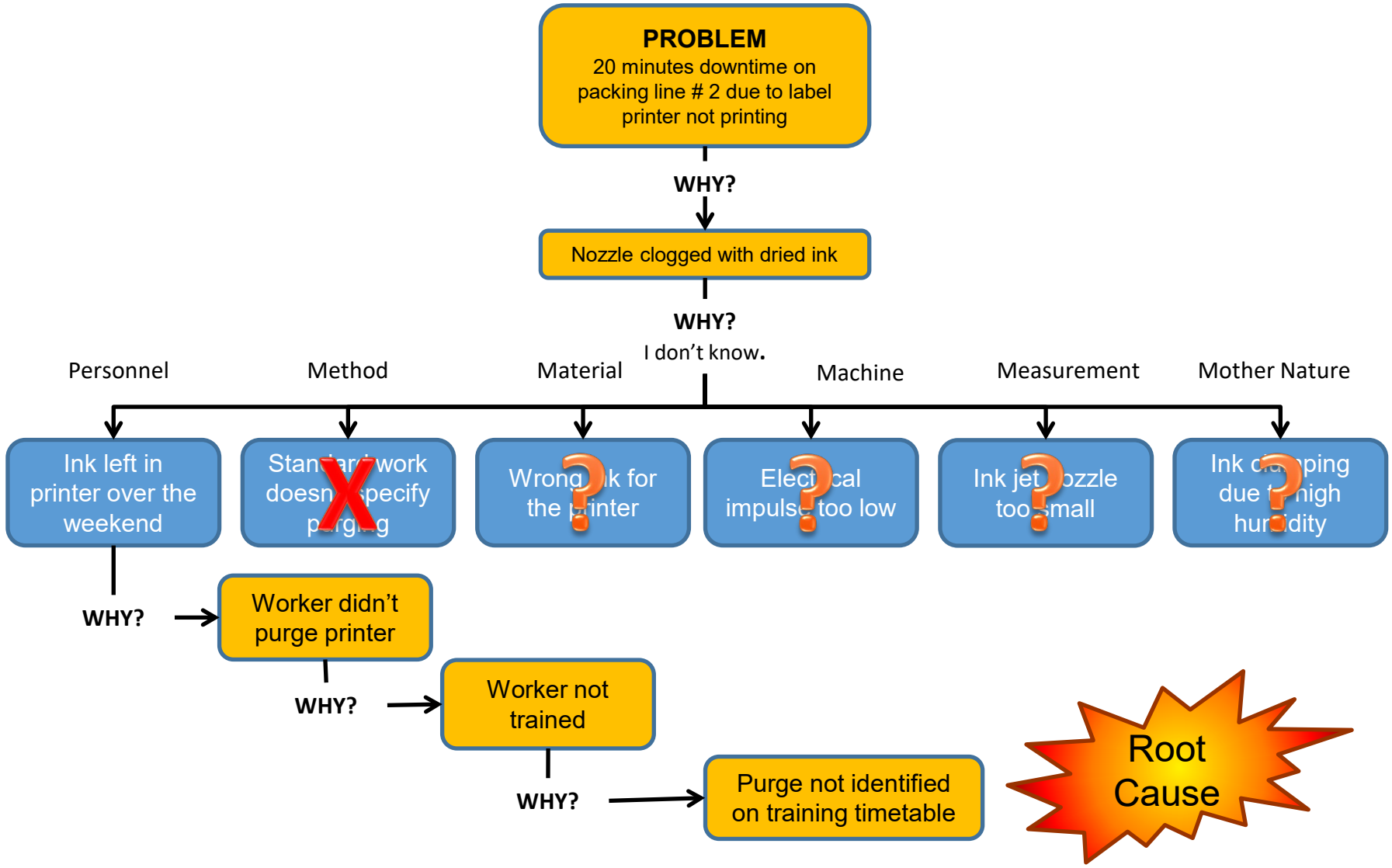
Example



Fishbone (Ishikawa) Diagram



Cause Map - Combined Fishbone and 5-Why



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Over the course of two days, an airline placed an unaccompanied minor on the wrong flight on two different occasions. On May 2nd, a child flying alone and under the supervision of the airline was scheduled to fly from Toronto ON to Winnipeg MB. Instead, she ended up in Calgary AB. One day later, a second occurrence with the same airline, this time out of Montreal. Instead of going to Halifax NS, this unaccompanied girl ended up in St.John NB. Very bad media publicity has potential to impact reservations / sales and overall company reputation. Already have seen a spike in reservation cancellations.

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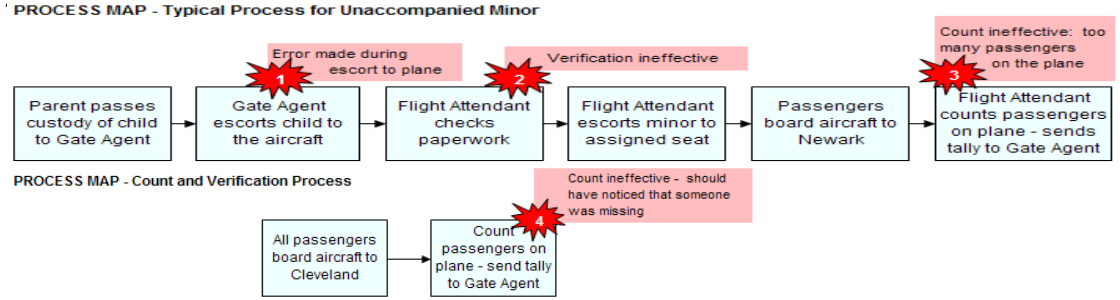

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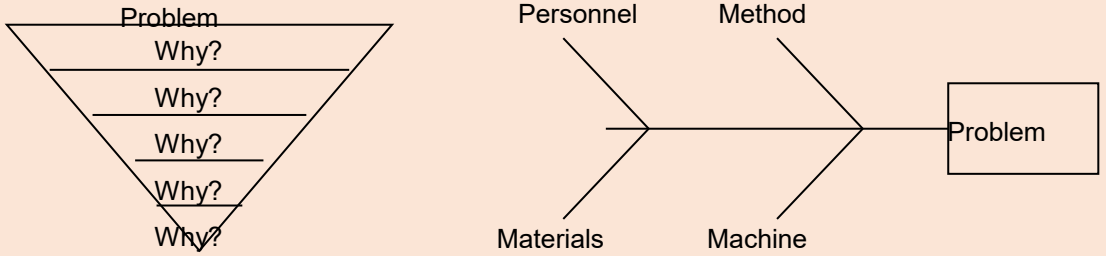

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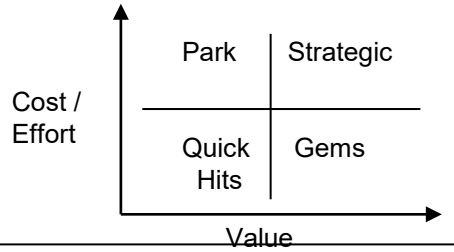

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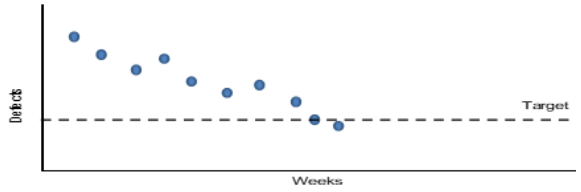


(8) Standardize: (Yokoten)

Standard Operating Procedure

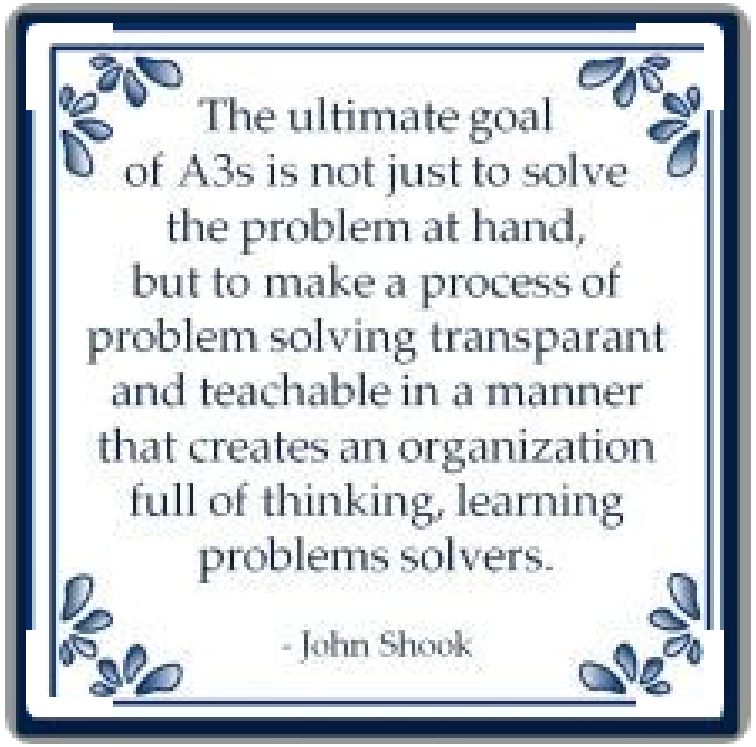
Group Session

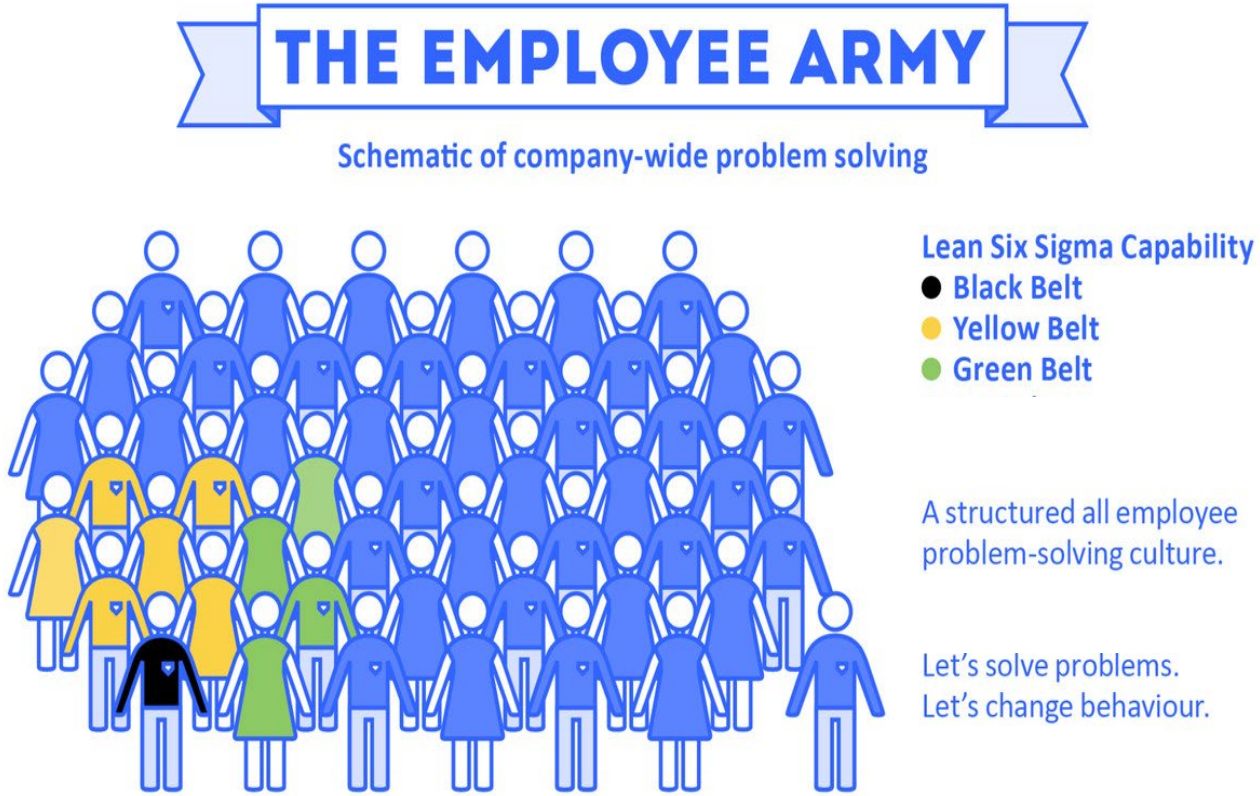
You have
14 minutes

You have 15 minutes to:

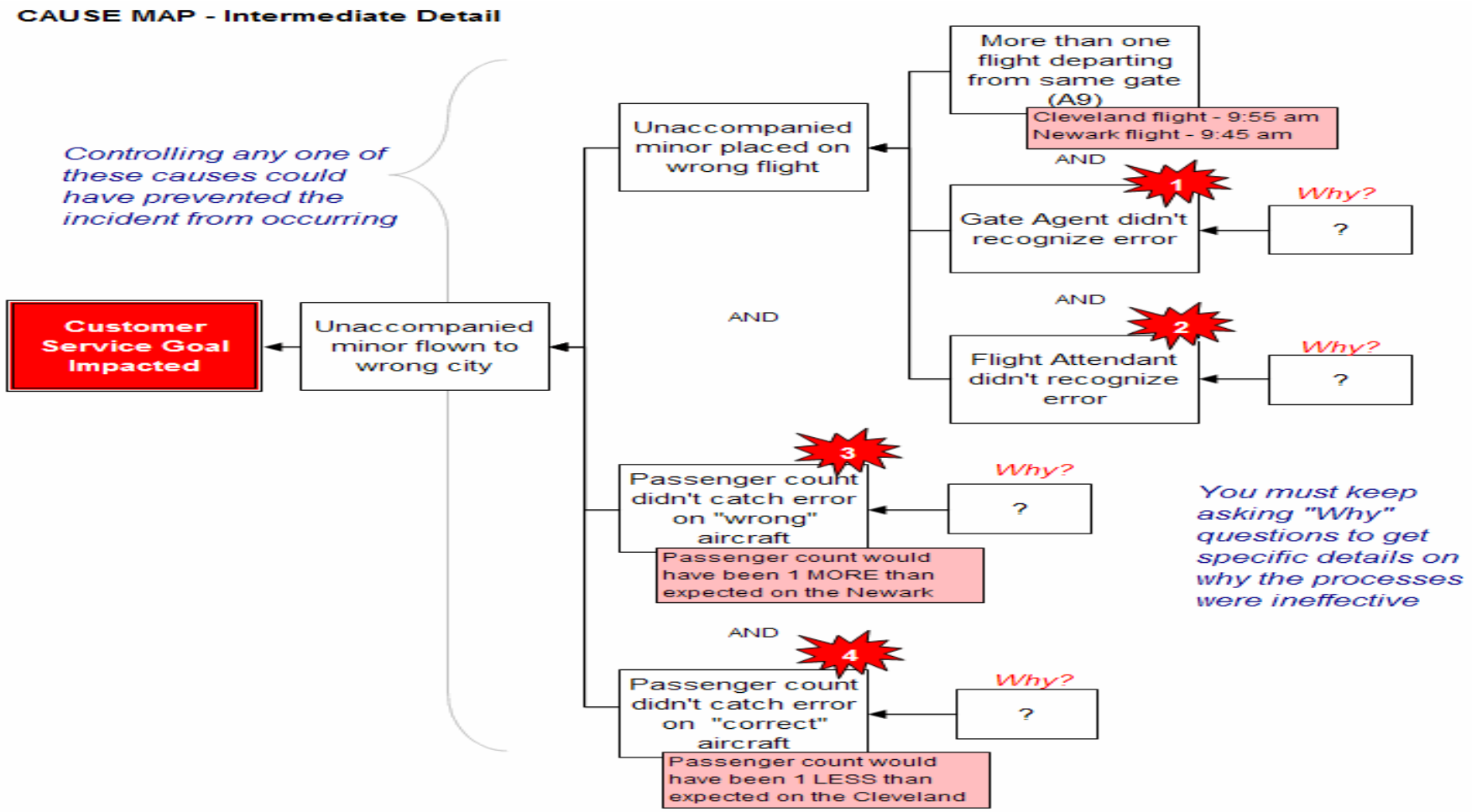
- Create a Cause Map and perform 5-Why on one POC's (9 minutes)
- Discuss to ensure you have captured specifically how the problem occurred. This should reveal what can be done to prevent future occurrences. Do Not however jump to solutions (5 minutes)
- Assign a spokesperson to present …

Analyze– Practical

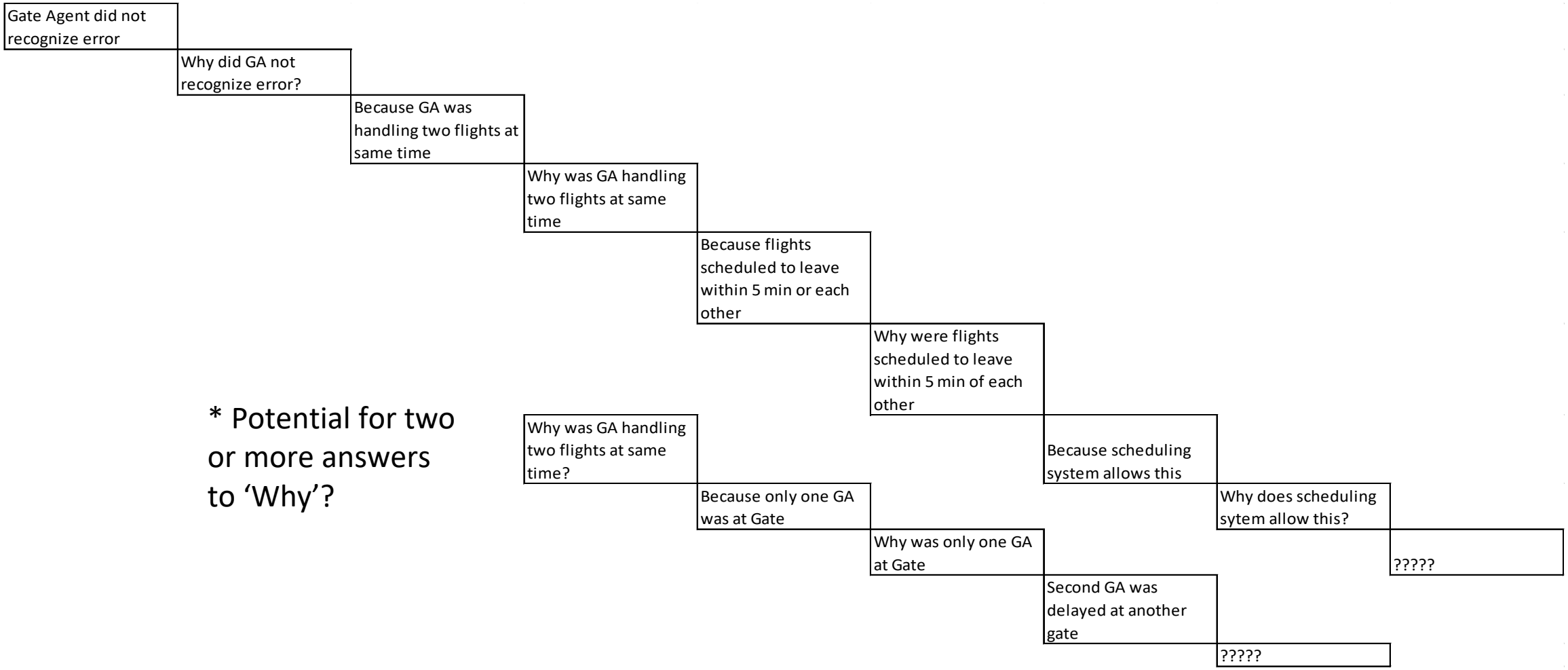




Analyze


CAUSE MAP - Intermediate Detail
Controlling any one of these causes could have prevented the incident from occurring
Customer Service Goal Impacted
Unaccompanied minor flown to wrong city
AND
Unaccompanied minor placed on wrong flight
More than one flight departing from same gate (A9)
Cleveland flight - 9:55 am
Newark flight - 9:45 am
AND
1
Gate Agent didn't recognize error
Why?
?
AND
2
Flight Attendant didn't recognize error
Why?
?
3
Passenger count didn't catch error on "wrong" aircraft
Why?
?
Passenger count would have been 1 MORE than expected on the Newark
AND
4
Passenger count didn't catch error on "correct" aircraft
Why?
?
Passenger count would have been 1 LESS than expected on the Cleveland
You must keep asking "Why" questions to get specific details on why the processes were ineffective

Analyze



* Potential for two or more answers to 'Why'?

Rationale/Problem Statement:

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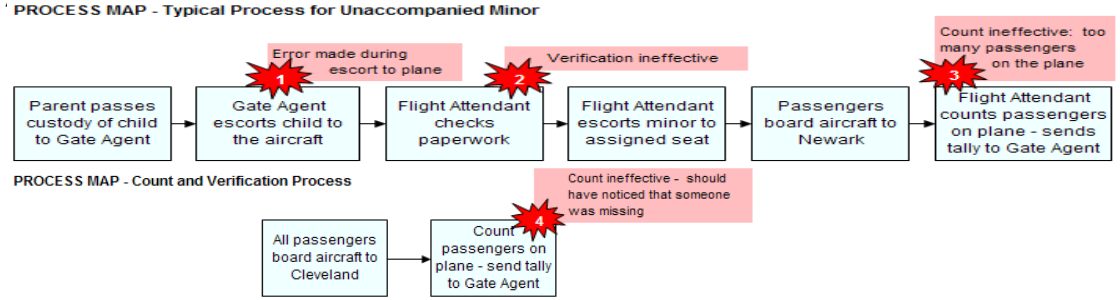
PROCESS MAP - Typical Process for Unaccompanied Minor



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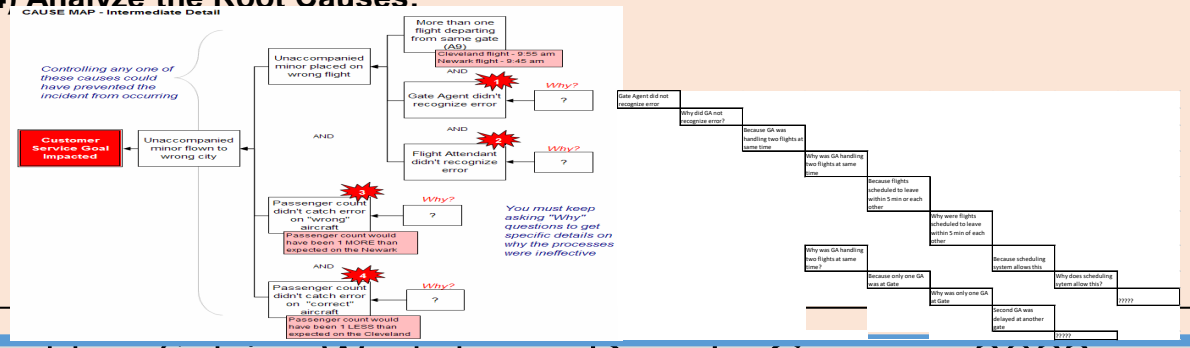

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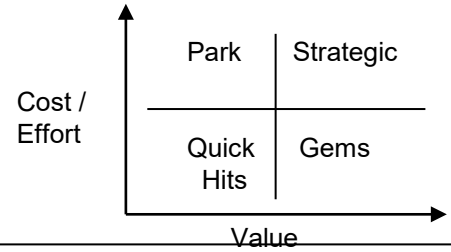

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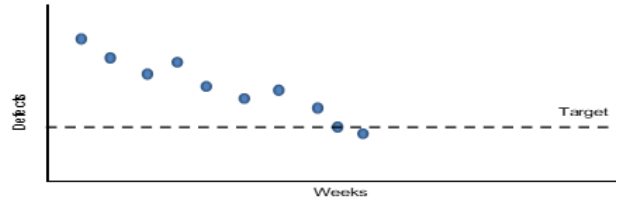
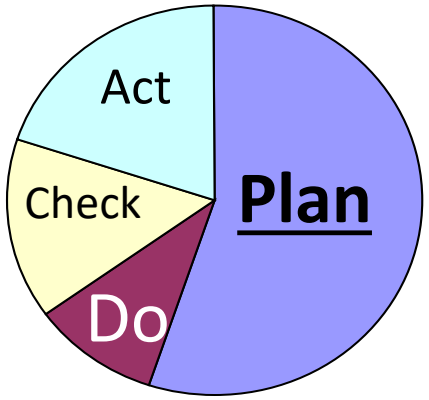


(8) Standardize: (Yokoten)

Standard Operating Procedure

Step 5: Develop Countermeasures / Solutions



(last Plan step of PDCA process)

1. Brainstorm countermeasures to the each of the Root causes
2. Prioritize the solutions
3. Create an action plan
4. Manage implementation
5. Reflect on the how the process was managed

Countermeasure Selection Matrix

Develop Countermeasures:

- **What potential countermeasures will address the root cause?**
- **Which potential countermeasures are most practical and effective?**
- **Build consensus with all process owners, suppliers, and customers.**
- **Create a clear and detailed action plan.**

Countermeasure	Safety	Quality	Productivity	Cost
1 Fix Std. Wrk.	Good	Good	Good	Good
2 Buy New Equip.	Good	Good	Good	N/G
3 Hire Another T/M to help	Good	Good	Good	N/G

Evaluate each potential countermeasure for its affect on Safety, Quality, Productivity, and Cost

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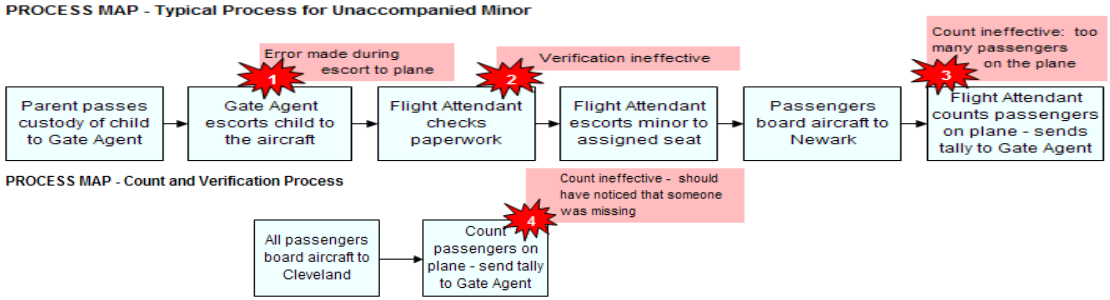

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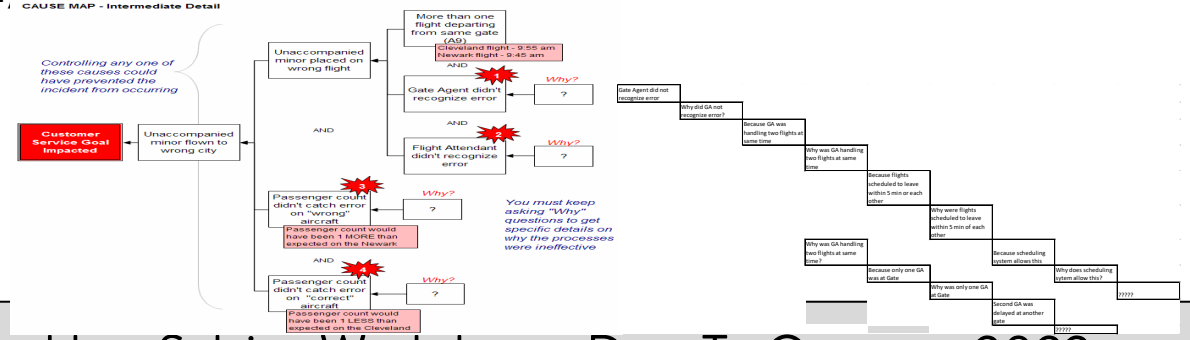
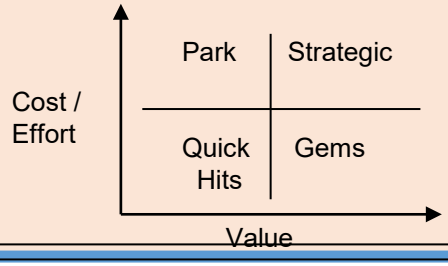


(5) Develop Solutions / Countermeasures:

Solution	Effect	Cost	Ease



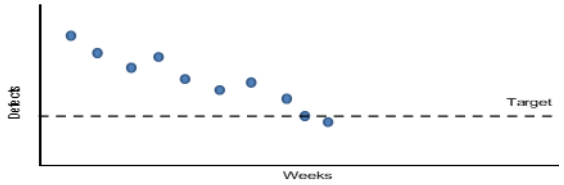
(6) Implement:

UM's put on wrong flights

Action	Who	Due

(7) Evaluate:

- Company's Viewpoint
- Teams Viewpoint
- Your Personal Viewpoint
- Customer's Viewpoint



(8) Standardize: (Yokoten)

Standard Operating Procedure

Group Session

You have
10 minutes

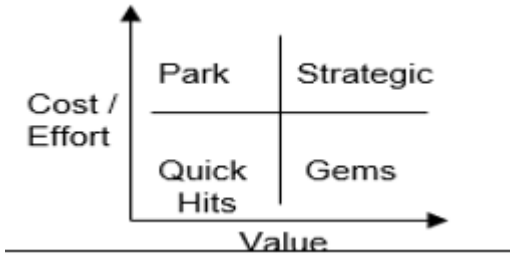
You have 10 minutes to:

- Brainstorm countermeasures to address the root causes you've identified (5 minutes)
- Create an evaluation matrix with criteria, discuss and build consensus on the top countermeasures. Consider all stakeholders viewpoints.
- (5 minutes)
- Assign a spokesperson to present …

Countermeasures / Solutions – Update

Countermeasure	Safety	Customer Acceptance	Quality	Cost
Have I.T. set gate time parameter to 20 min	High	High	High	Med
Count difference will result in flight hold till resolved	High	High	Med	High
GA to call superivors if 2nd GA not available. UM hold until Supervisor or 2 GA arrives	High	High	High	Low

- Establish Criteria that makes sense for this problem / situation
- Evaluate, Rank, Vote, etc to determine top priority countermeasure(s) to implement first



Implementation – Update

Action	Owner	Date
Supervisor Call List & Procedure	Jane D	15 June
Check Sheet/ hold	Bill D	21 June
I.T. Program update to 20 min time between two flights leaving same gate	Tim T	1 July

- Drives Accountability
- Must include owner and due date
- Dates may need to change but must be obvious and agreed to

Rationale/Problem Statement:

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Title: Unaccompanied Minor – Wrong Flight

Date: 15/6 By: J.Doe Approval: C.Harvey

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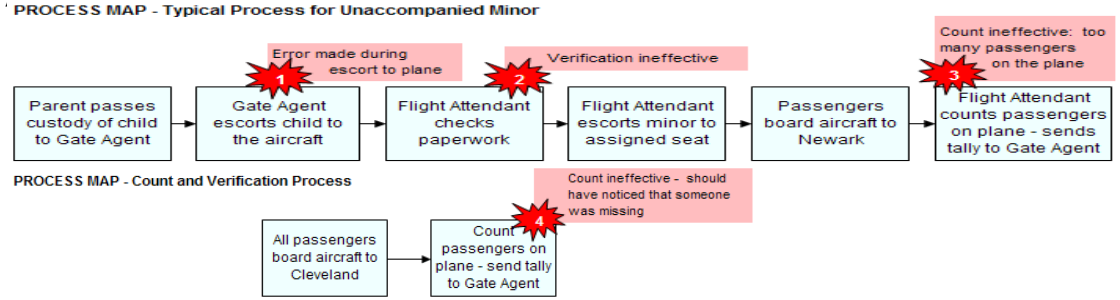

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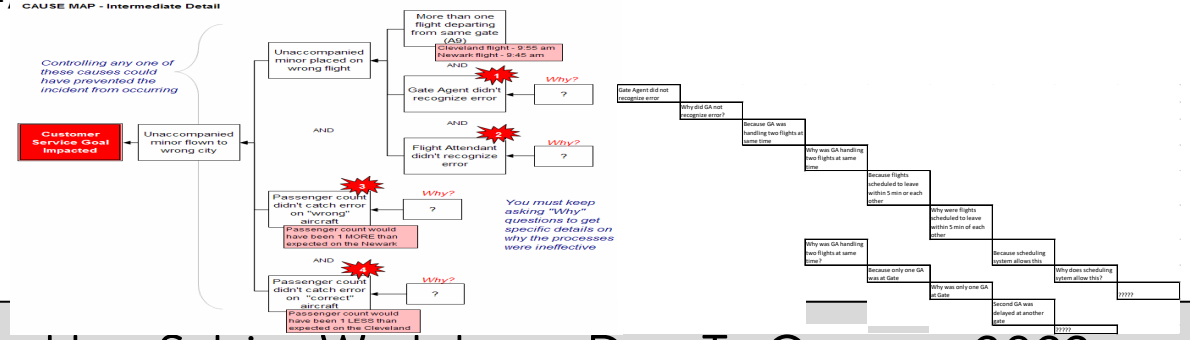

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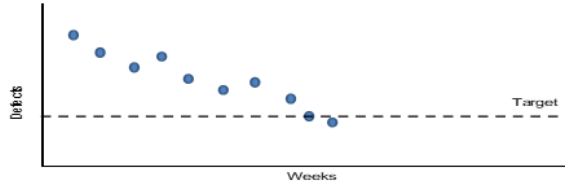

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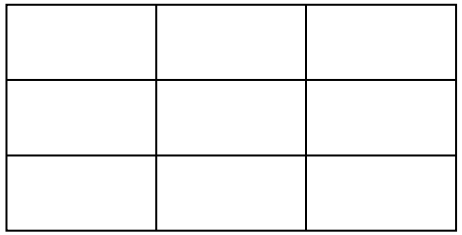
Standard Operating Procedure



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Evaluation– Update

- Select customers who have sent minors on trips were given a presentation on changes and given opportunity to provide input and feedback. Very positive outcome with additional actions taken

- Staff indicated this was first time all functions were included and had input in this problem solving process so result was very positive.

- Management appreciated how thorough the analysis was done, and supported the changes instead of assigning blame. Positive employee relations.

Solutions, Implement, Evaluate– Practical

- When developing solutions ensure the Stakeholders / Process Owners are involved.

  No Buy In = No Sustained Results
- Make it Visual and have a regular cadence for review at Gemba
- Adopt formal report out process for A3 teams
- Evaluation / Feedback / What Did I Learn / What Can We Do Better Next Time is critical input as learning = CI
- Reward performance / Tie results to performance reviews
- Have 30-60-120 day follow up assessments
- Don't be afraid to go back to Steps 3-5 if you are not getting desired result (process can be iterative)

Standardize/Yokoten – Theory

Standardize is creating a way to ensure the process is repeatable

- Locking in the process through SOP, LPA, etc

Yokoten is a Japanese word that means share. Once the solutions have been proven, tweaked and standardized, share them with other departments or branches to ensure the best practices are being capitalized on

Standardize/Yokoten– Practical

Creating an SOP / Standard Work Document to 'Lock In' the process is a Critical last step in the process.

However if you stop there you are missing the intent of Yokoten so ensure you:

1. Share your A3 widely within organization as other departments or plants likely have a similar or same problem. No need to re-invent the wheel.
2. Establish 'Best Practice' teams and share A3's with those teams
3. Update your training (for all shifts) to ensure everyone is using the correct SOP
4. Use LPA process to monitor and prevent slipping back to old ways

Rationale/Problem Statement:

Over the course of two days, an airline placed an unaccompanied minor on the wrong flight on two different occasions. On May 2nd, a child flying alone and under the supervision of the airline was scheduled to fly from Toronto ON to Winnipeg MB. Instead, she ended up in Calgary AB. One day later, a second occurrence with the same airline, this time out of Montreal. Instead of going to Halifax NS, this unaccompanied girl ended up in St.John NB. Very bad media publicity has potential to impact reservations / sales and overall company reputation. Already have seen a spike in reservation cancellations.

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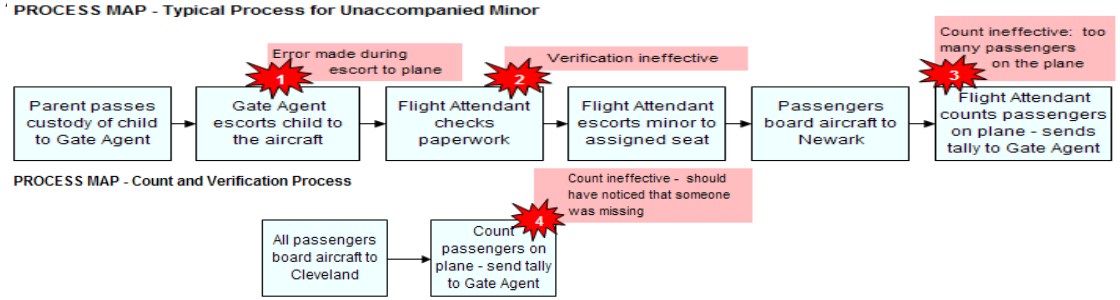

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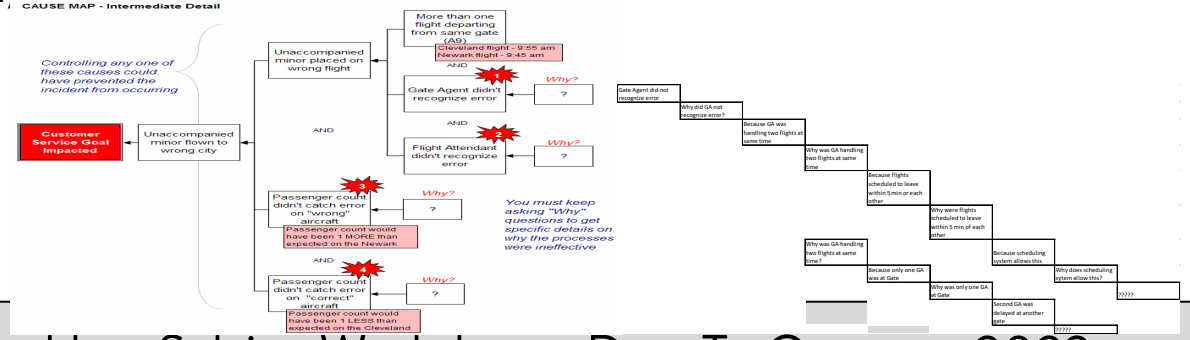

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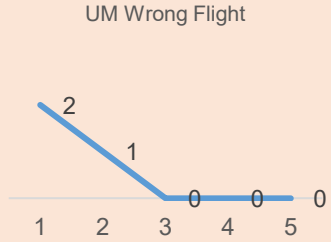

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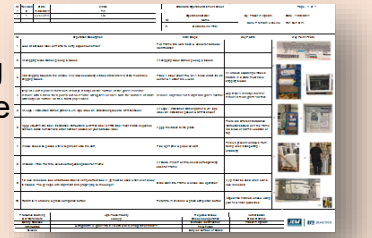
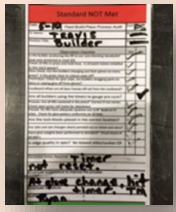


LPA / Checklist



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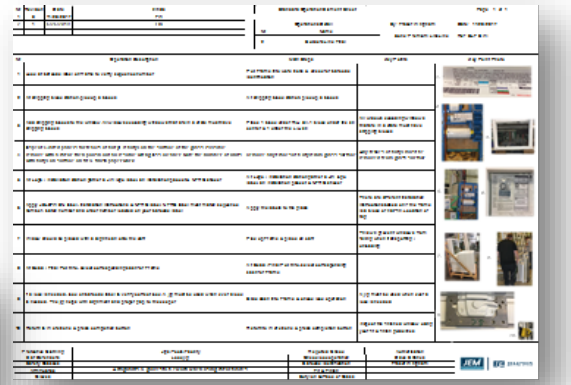
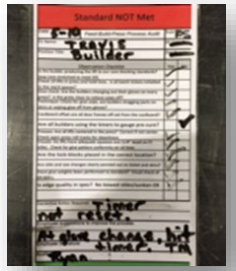
Follow-up /Long Term Actions

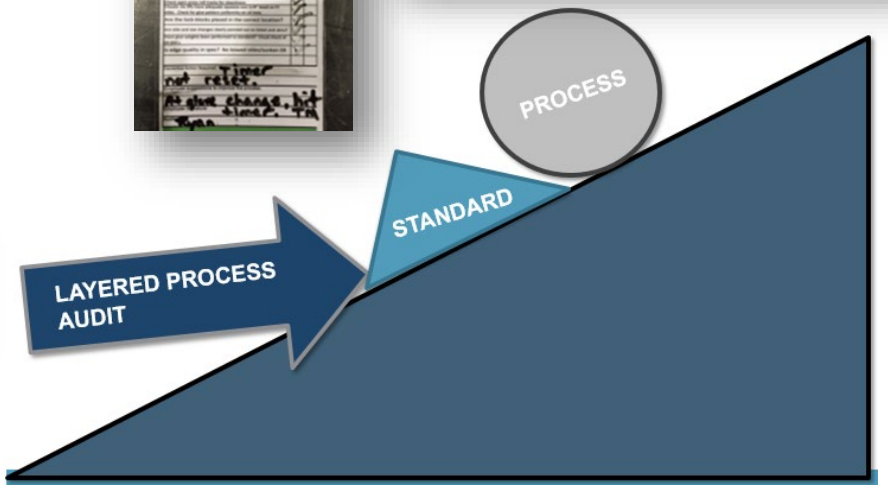
SUSTAIN THE GAINS

Deploy the infrastructure for success and create a cadence for ongoing actions

- Update standard work
- Audits
- Dashboards
- Reviews







Action	Effectiveness	Feasability	Time to Implement	Cost
Controller and roller press implementation	High	Moderate	>6 Months	$100k-$250k
	Medium	Go Do	>6 Months	>$250k

Long-term actions (design the risk out of the process)

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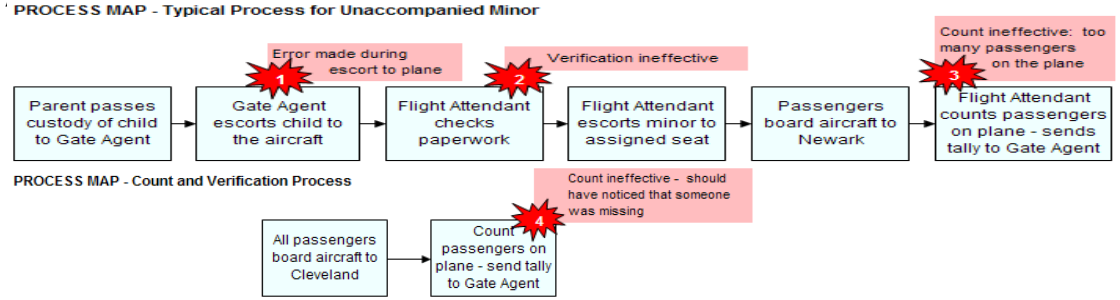

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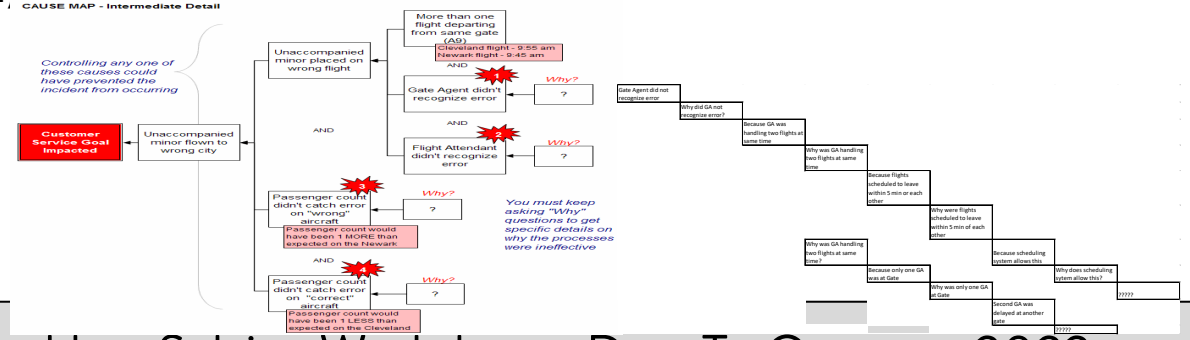

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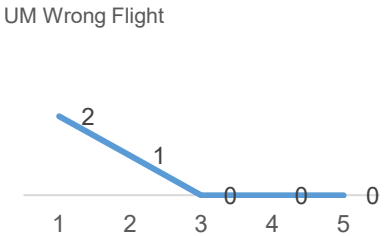

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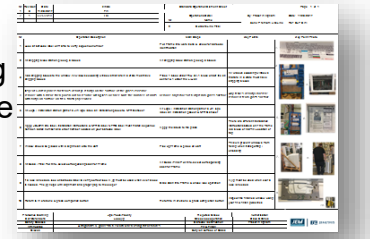

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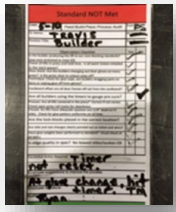

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The Home Stretch

New Tools = Success…. Right?

=

Roadblocks

- Starting at the wrong level
- You don't teach calculus in Grade 1, so start with the basic building blocks of A3's. Get training and support.
- Pick a couple problems and work the process, don't rush !
- At the beginning learning is more important
- Don't Mandate Everyone Do 'X' number of A3's Weekly
- Not going back to Step 3 – 5 when you are not getting the desired results

Questions to Ask '<u>Before</u>' You Launch into an Major Problem Solving Exercise

Answer the following questions:

	Y	N		Y	N
1) Is there a standard? (work, job instruction, etc.)			5) Correct parts/components used ?		
2) Was the associate/operator trained?			6) Has preventive maintenance been performed?		
3) Standard is followed? (Seq,What,How ,Why)			7) Is there any error proofing?		
4) Correct tools/fixtures used ?			8) No abnormal events (power voltage, recent PM, etc.)?		

If yes for all 8 questions, proceed to problem solving with team

If answers to questions 1-8 are *<u>NO</u>*, complete 5 whys analysis for each no response

Make Problem Solving a 'Top 5" Priority for All Areas and Assess Competency Regularly

		Requirement		Area 1	Plant Average
Basic Problem Solving and RCCA	Problem Solving	Knowledge/ Awareness: All leaders have overall knowledge of BPS/RCCA techniques. Challenge if the basic problem solving techniques are known and how they should be applied.	3	3	100%
		Measure Performance: Correct data is available to quantify deviation/ gap to target. Area can clearly state current performance, issues with detailed explanation and actions taken to get back on target.	3	2	67%
		Analyse and Fix: Problem solving follows structured approach to quantify issues, understand where caused, how the issue was created and what actions are required to prevent re-occurrence. Evidence of structured approach following A3 Problem solving, 8D or DMAIC type approach.	3	2	67%
		Root Cause analysis: Evidence of root cause analysis that supports fixing of the underlying issues and ensures the same issue does not repeat in the future.	3	2	67%
		Management: Problem solving in use daily and driving Continuous Improvements. Evidence that problem solving processes are used in daily business to fix issues identified during SQDCI reviews.	3	2	67%
		Management: Actions are clearly tracked and delivered in line with proposed timings. Leadership discipline to fix the issues and drive to completion.	3	2	67%
		Score:	18	13	

Round Table/ Call to Action

YOUR OPINIONS ARE IMPORTANT TO US!

Complete our Survey at
EMBRACINGEXCELLENCE.CA/SURVEY

Scan QR code in your **Program Book** or **Schedule** or **BELOW**

THANK YOU!

Jim Neirinck

President, JCN Ent.

C: 204-451-4989

Email: jcn@mymts.net