

# Continuous Improvement

Solving Problems That Change Lives





## Problem Solving

Identify and solve the root causes of  
problems using CI tools

# Agenda



- Welcome
- Ground Rules
- Introductions
- Problem Solving Tools
- Hands on Practice and Group Activities





# Introductions: share as you wish

- Your Name
- Agency or Branch of Government, and Location
- What you do
- One outcome you would like from the class today



# Course Objectives

- Enhance your ability to identify and understand problems
- Learn steps and tools to help you identify and solve root causes of problems
- Incorporate problem solving into your daily work
- Build your skills with CI tools

# Tools and Concepts We Will Cover

- A3 Problem Solving Tool
- Voice of the customer (VOC)
- Program and process measures
- Brainstorming
- Affinity Diagram
- Root cause analysis tools:
  - 5 Whys
  - Fishbone (Cause and Effect) Diagram
  - Relations Diagram
- Impact/Cost Matrix
- Action Plan
- Performance Measures Table



# Problem Solving – Why do it?

- Increase customer value and satisfaction
- Make work better for staff
- Save resources
- Grow a high performing work culture

# Problem Solving Example



**Problem:** The Jefferson Memorial was disintegrating rapidly because of the frequent cleaning needed to remove the bird droppings

Why were there so many bird droppings?

Why were the cleaning methods so abrasive?

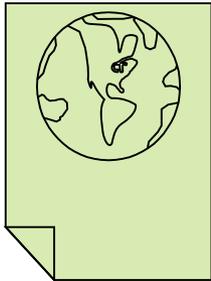
Why?  
Why?  
Why?

- 
- 
- 

**Root Cause!**

**Five Why Analysis** helps drive to source of the problem

The actual technique can take more or fewer iterations



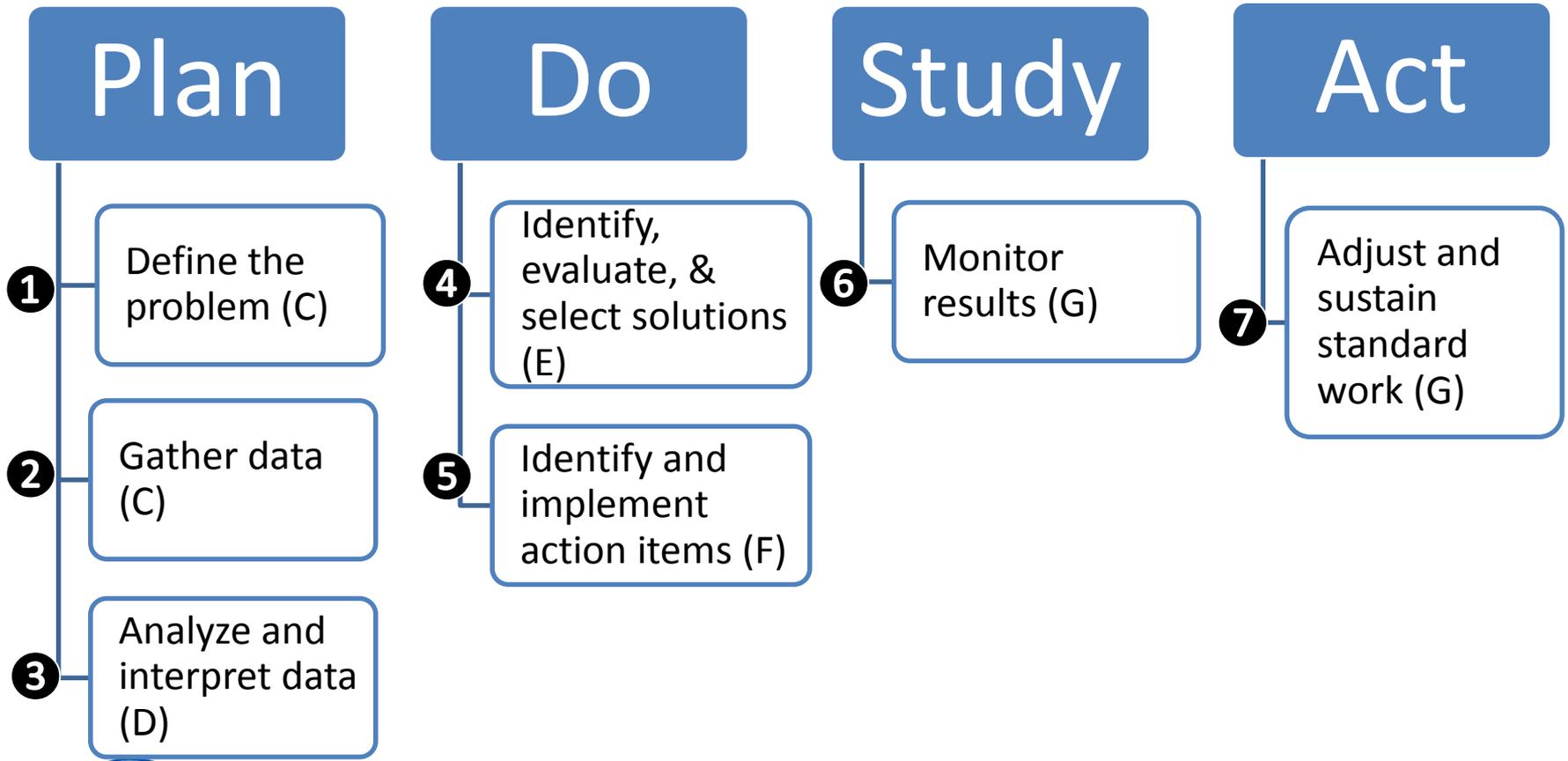
How many why's did it take to get to the root cause of the Jefferson Memorial's problem?

# A3 Problem Solving Tool

A3 PROBLEM SOLVING TOOL: <Title>		Contact: <Name>	Date: <.date.>																												
<b>BACKGROUND / BUSINESS CASE</b> <div style="text-align: center;"><b>A</b></div>		<b>SOLUTIONS</b> <div style="text-align: center;"><b>E</b></div>																													
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		<b>METRICS/FOLLOW-UP</b> <div style="text-align: center;"><b>G</b></div>																													



# 7 Step Problem Solving Process



# ABC Agency's Hiring Process



## Problem:

- It is taking ABC agency too long to fill positions. Because of the long time period, current employees are overworked and the best job candidates are taking positions with other organizations. ABC has also experienced an increase in the attrition rate of new hires the past three years. We need to find out why.

# Background/Business Case (5 min)



<b>BACKGROUND / BUSINESS CASE</b>  <b>A</b>	<b>SOLUTIONS</b>
<b>STAKEHOLDERS</b> <ul style="list-style-type: none"><li>• Customers:</li><li>• Team Members:</li></ul> <b>CURRENT CONDITION</b>	<ul style="list-style-type: none"><li>• What issue or problem do you wish to solve?</li><li>• Why is this issue important to solve now?</li><li>• What benefits do you anticipate from solving the problem (e.g., quality, timeliness, cost, customer/employee satisfaction)?</li></ul>
<b>ANALYSIS / ROOT CAUSES</b>	<b>METRICS/FOLLOW-UP</b>

# Stakeholders (5 minutes)



<b>BACKGROUND / BUSINESS CASE</b>	<b>SOLUTIONS</b>
<b>STAKEHOLDERS</b> <ul style="list-style-type: none"> <li>• Customers:</li> <li>• Team Members:</li> </ul>	<b>ACTION ITEMS</b>
<b>CURRENT CONDITION</b>	
<b>ANALYSIS / ROOT CAUSE</b>	<b>METRICS/FOLLOW-UP</b>



• Who are internal and external customers?  
 • Who's perspectives do you need to complete the A3 Problem Solving Tool (e.g., subject matter experts, customers, outside set of eyes)?

Actual
ite

# 1. Define the problem



# Problem Definition Tools



Brainstorming

Affinity  
diagram

# Brainstorming

Brainstorming is a team-based strategy for quickly capturing diverse information, ideas, and perspectives.

## Brainstorming Rules\*:

- Think of as many ideas as you can
- Postpone judgment
- Clarify, combine, and build on ideas



\*When brainstorming about the cause of the problem ...

- Be creative! Everyone Participates!

# Diversity & Inclusion



CI supports the inclusion of staff and customers based on experience with the process and regardless of background



**CI is about Equity, not Equality**

# Brainstorming Potential Problems



- Waiting: hand-off delays
- Inefficient or illogical work flow
- Unreliable equipment or limited equipment capacity
- Process complexity
- Motion

# Brainstorming Potential Problems



- Numerous sign offs
- Over-processing (exceed customer specs)
- Overproductions
- Too much inventory or documentation
- Bottlenecks/backlog
- Transportation

# Brainstorming Potential Problems



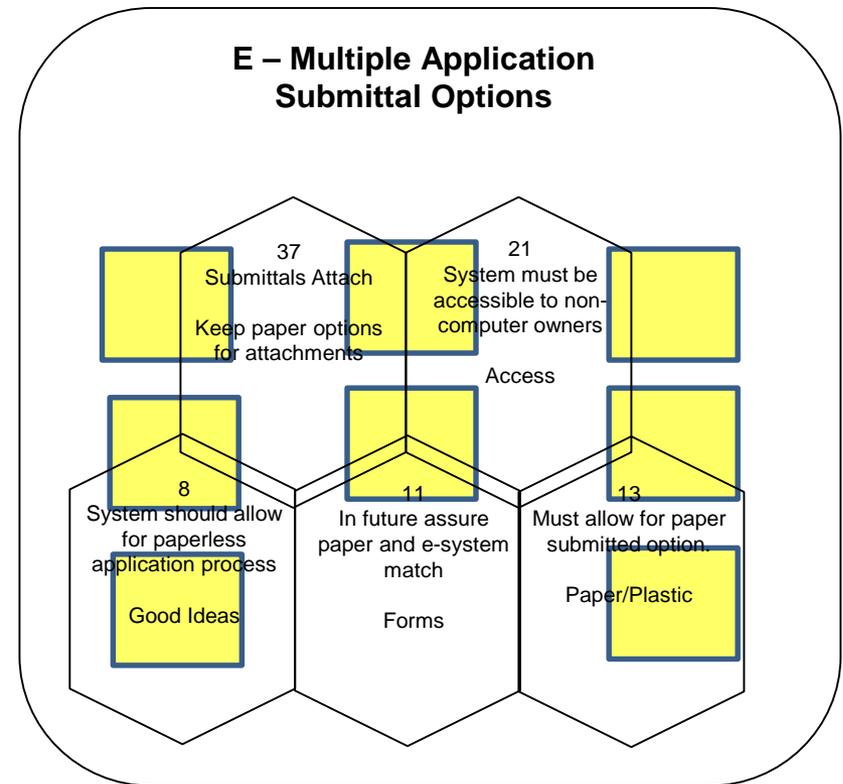
- Errors
- Rework
- Defects
- Unclear roles & responsibilities
- Vague customer requirements

# Grouping and Theming Ideas

## Random Ideas



## Affinity Diagram



# Brainstorm Problems (5 min.)

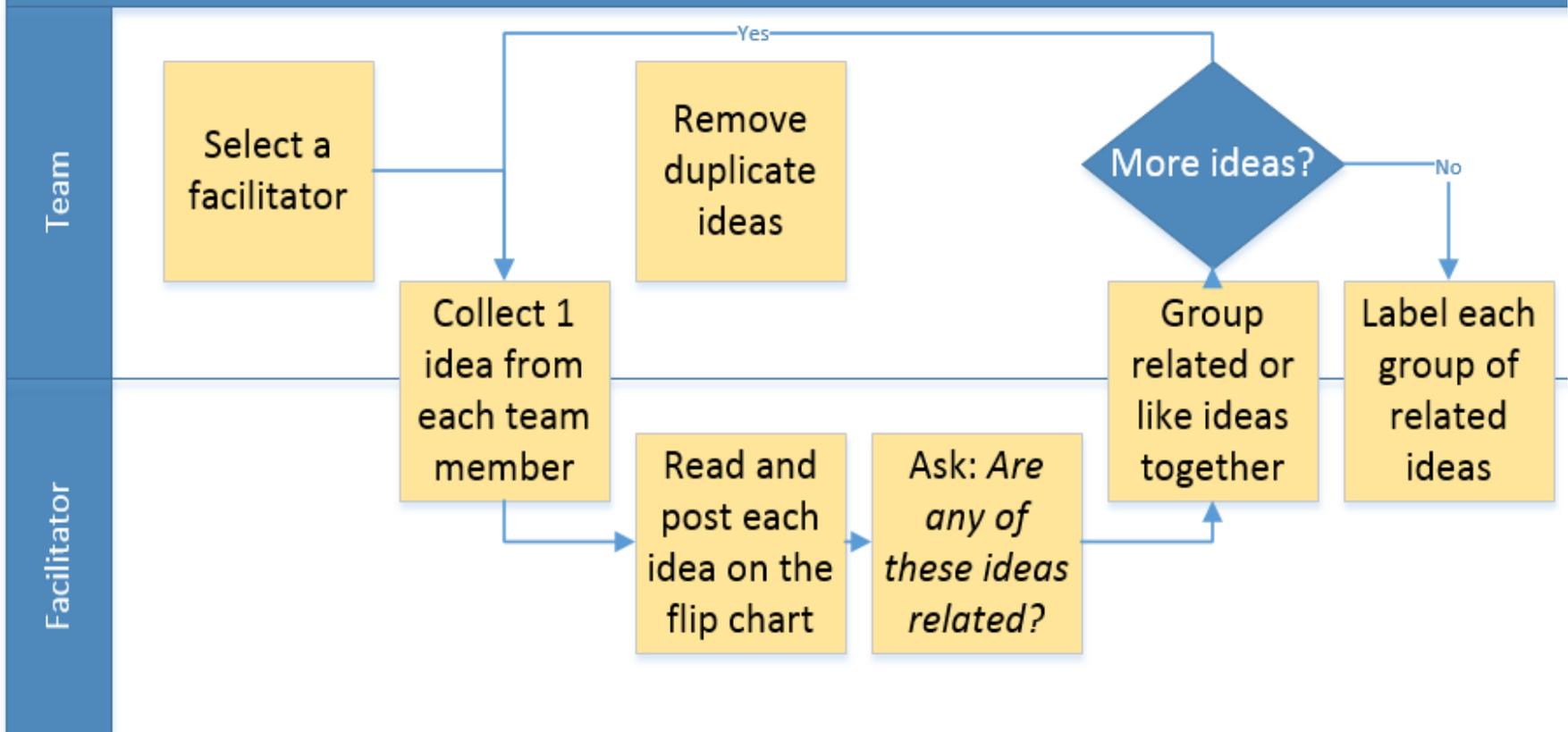


- Brainstorm possible causes and contributors to the **problem**
- Individually brainstorm possible causes and contributors to why the hiring process is taking so long
- Record one idea per post-it.
- Be creative – we will build upon your work throughout the course!

# Affinity Diagram (15 minutes)



## Affinity Diagram Process



## 2. Gather Data

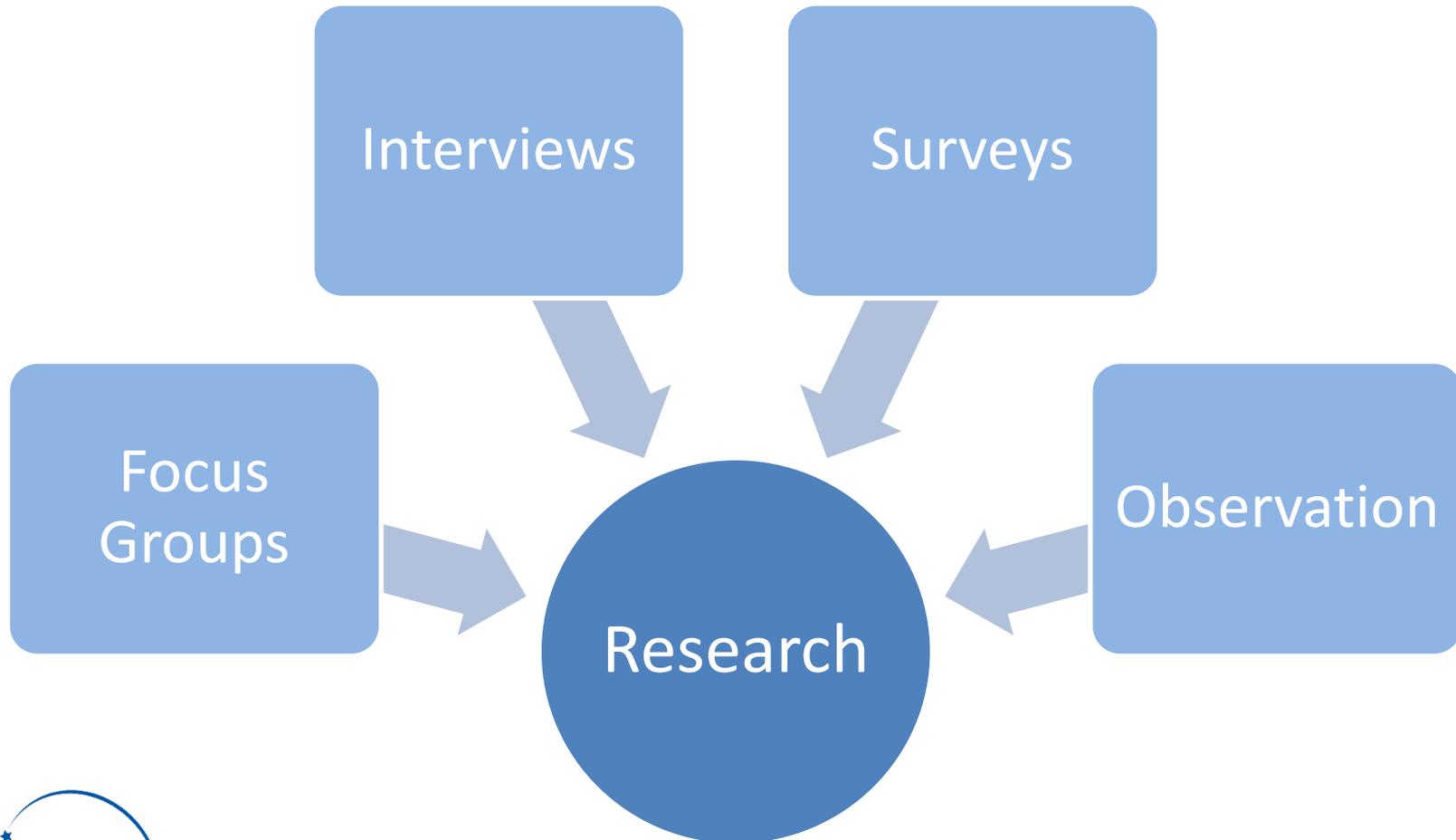


# Voice of the Customer



- Who are our customers and key customers?
- What do they want/need?
- How are we gathering that information?

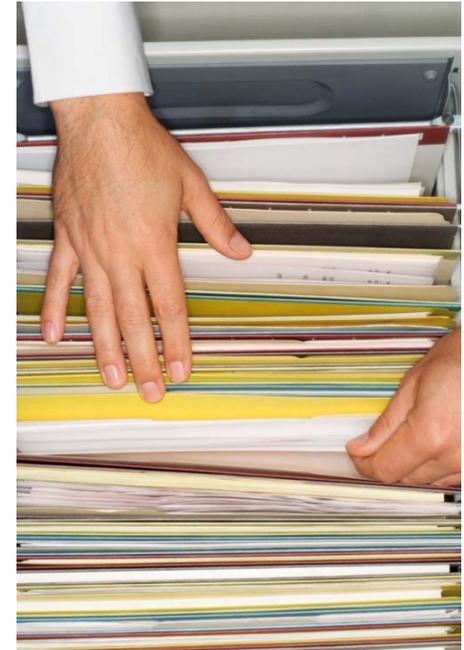
# Customer Research Methods



# Program and Process Data

## Types of data:

- Quantity: How much did we do?
- Efficiency: Cost per unit; Process time
- Quality: How well did we do it?
- Effect: Is the customer better off? Did the customer achieve desired results?



# Current Condition (15 min.)



**BACKGROUND / BUSINESS**

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**STAKEHOLDERS**

- Customers:
- Team Members:

---

**CURRENT CONDITION**

**C**

- What do you know?
  - *What* errors are occurring?
  - *Where* are the errors occurring?
  - *When* are the errors occurring?
  - *Who* is making the errors?
  - *How* are the errors occurring?
- What don't you know and need to find out?

What	Who	When

- What specific performance measure needs to improve?
  - **Problem Statement:** Reduce/Increase the number/percent of <?> from <current level> to <desired level> by <date>.

# 3. Analyze & interpret data

<b>BACKGROUND / BUSINESS CASE</b>	<b>SOLUTIONS</b>
<b>STAKEHOLDERS</b> <ul style="list-style-type: none"> <li>• Customers:</li> <li>• Team Members:</li> </ul>	<ul style="list-style-type: none"> <li>• Why are the errors occurring?             <ul style="list-style-type: none"> <li>○ Use the simplest tool to show cause-and-effect down to root cause(s)</li> <li>○ Root cause analysis tools:                 <ul style="list-style-type: none"> <li>➤ 5 Whys</li> <li>➤ Fishbone diagram and 5 Whys</li> <li>➤ Affinity and Relations diagrams</li> </ul> </li> </ul> </li> </ul>
<b>CURRENT CONDITION</b>	
<b>ANALYSIS / ROOT CAUSES</b> <div style="text-align: center; margin-top: 20px;"> </div>	<ul style="list-style-type: none"> <li>• Does our data verify the root causes?             <ul style="list-style-type: none"> <li>○ If not, a team may need to collect additional data to verify the root cause(s)</li> </ul> </li> </ul>

# Symptom or Root Cause?

**Symptoms:** You see it, people talk about it; it is visible!



**Root Cause:** The one to address. It is often hidden. You need to find it!

*Defining the “wrong” problem wastes time.  
You end up looking for a solution in the wrong place.*



# Benefits of Root Cause Analysis Tools

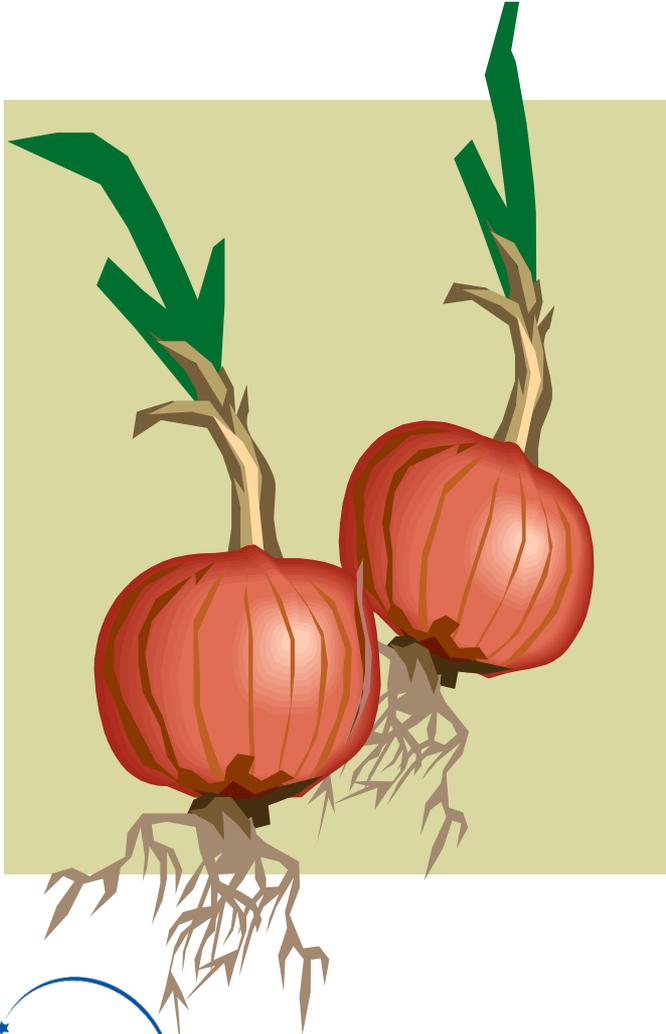
Solve the problem once and for all

Identify and focus on the root cause with the greatest impact on productivity

Improves productivity: less headaches for staff → happier staff!

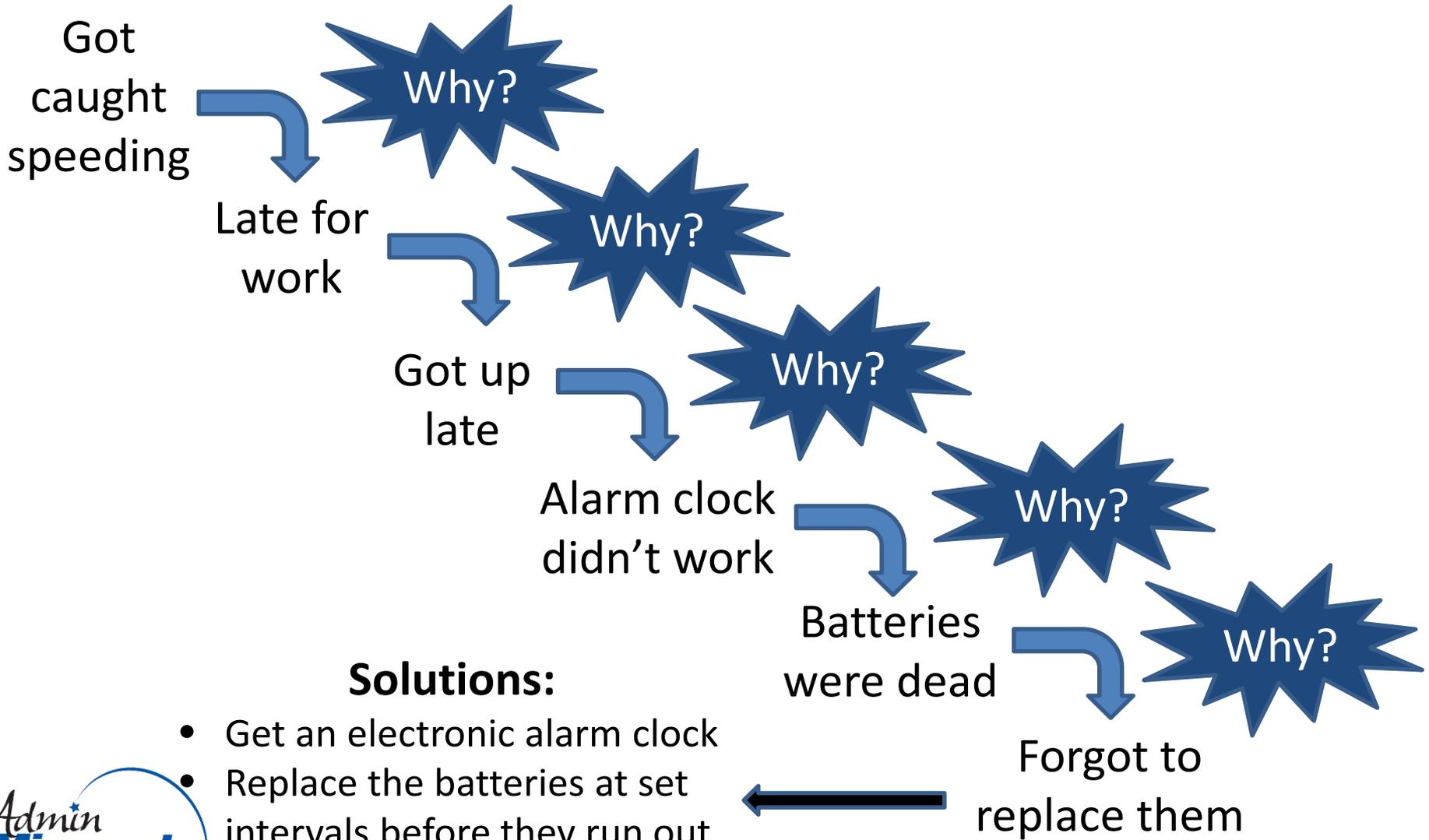
Save resources: solution may cost less than addressing symptoms

# 5 Whys

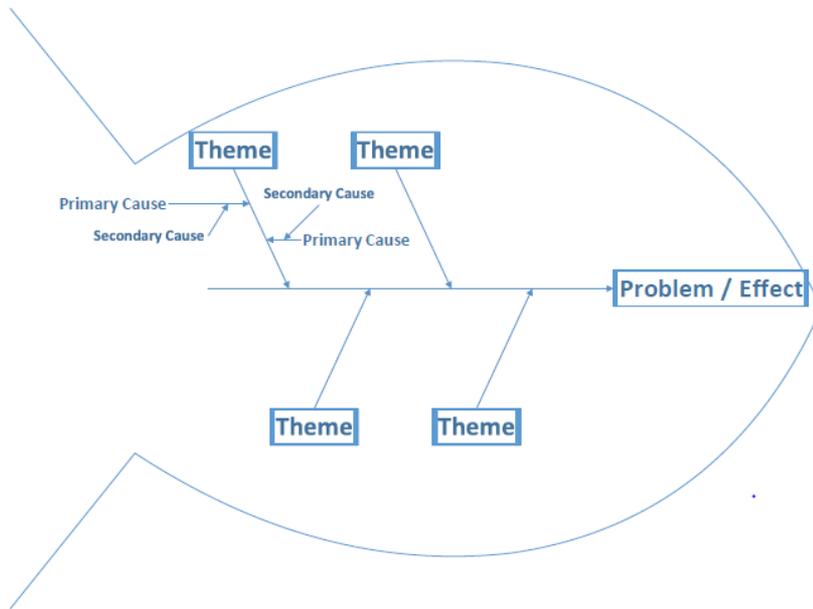


- A simple, quick method for getting from symptoms to the **root cause** of a problem by repeatedly asking *Why?* (logic chain)
- Use with fishbone diagram

# 5 Whys Example

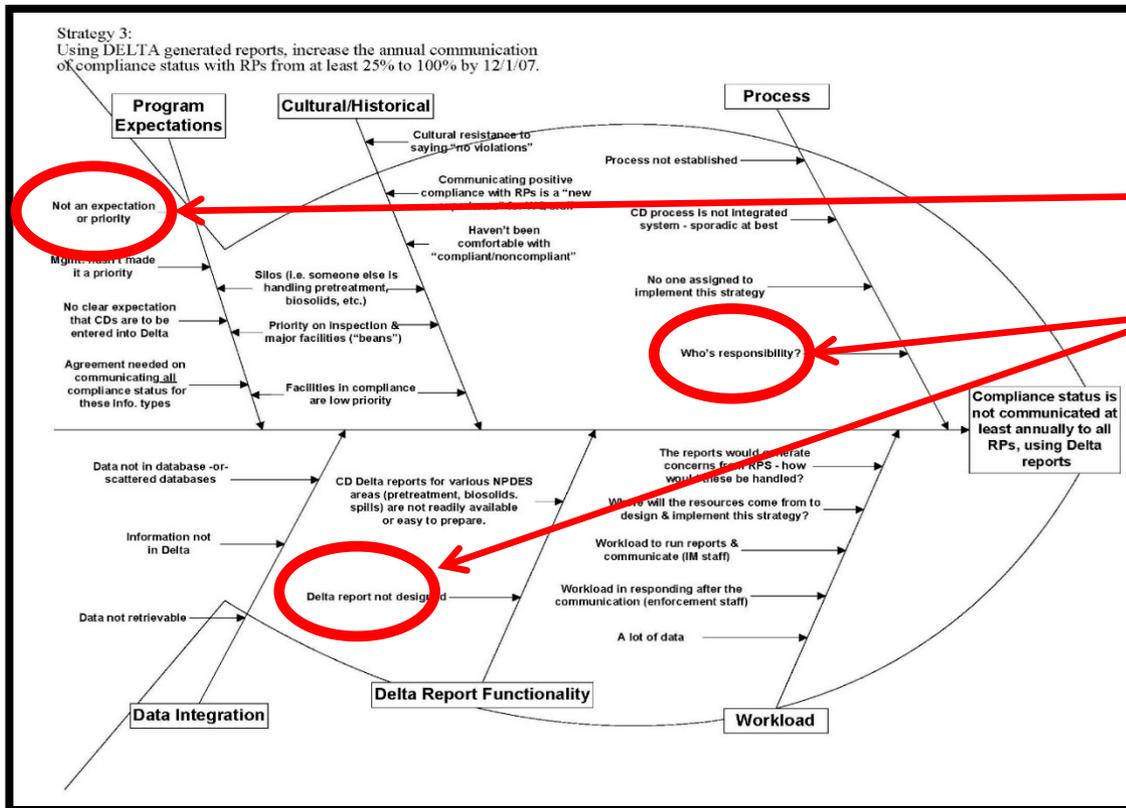


# Fishbone (Cause & Effect) Diagram



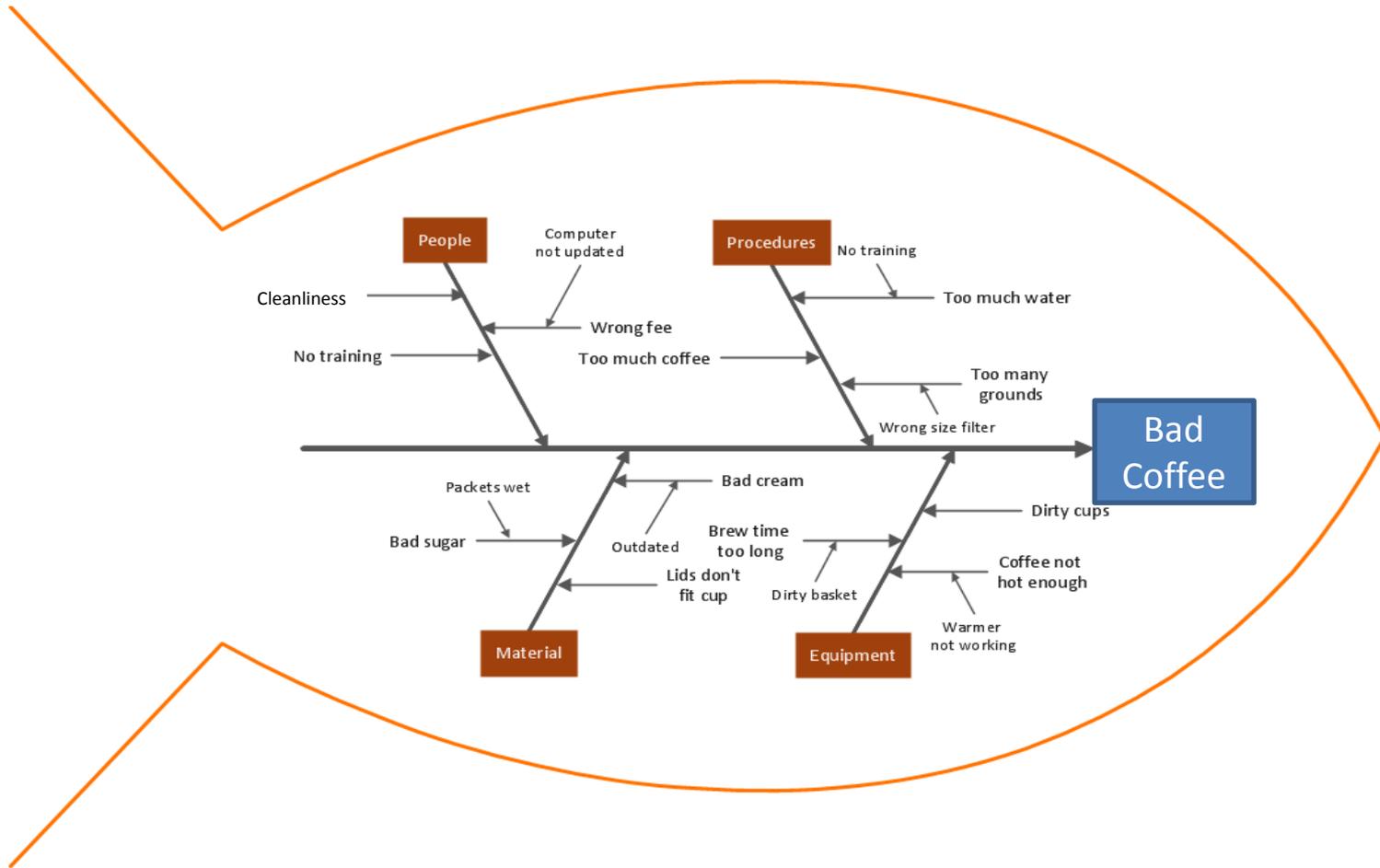
- Cause and Effect Analysis
  - Identifying likely causes of problems
- Ishikawa Diagram - fishbone
- A team-based tool for visually showing possible root causes of a problem
- Cause categories:
  - People (roles, trng.)
  - Equipment/Tools
  - Process/Policy
  - Materials
  - Environment
  - Technology

# Fishbone Diagram

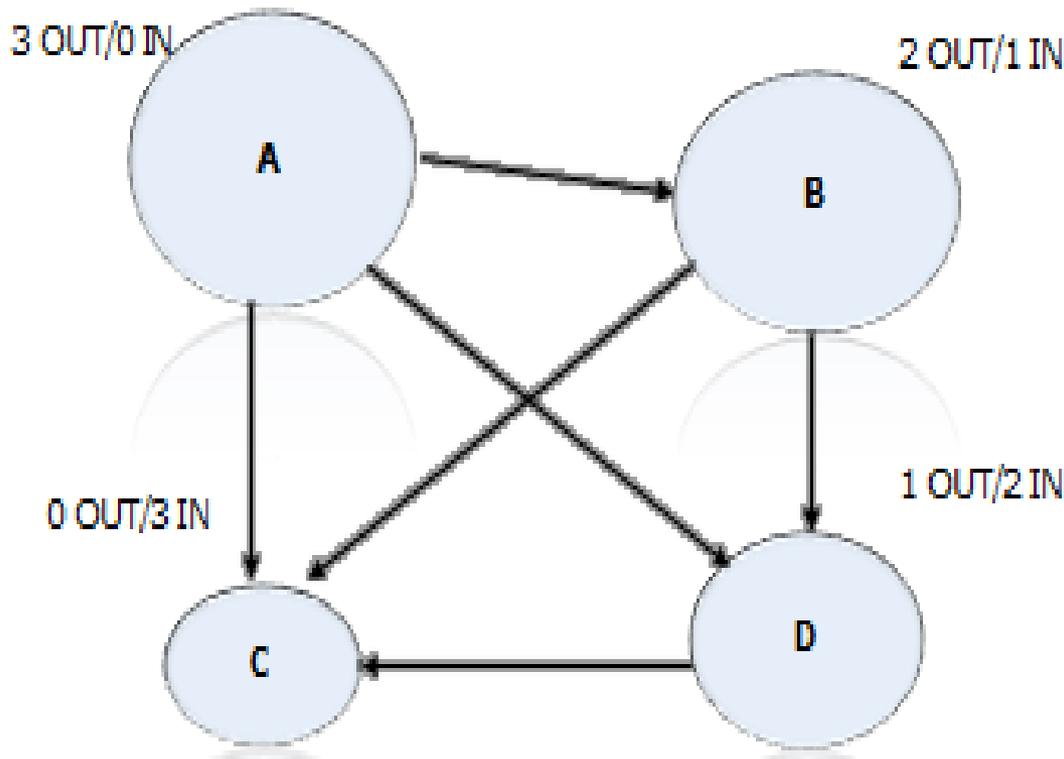


The same cause noted under multiple themes may be a root cause

# Fishbone Diagram Example



# Relations Diagram



- A team-based tool for identify key drivers or contributors to a problem
- A cause category (theme) with many outward arrows may be a root cause

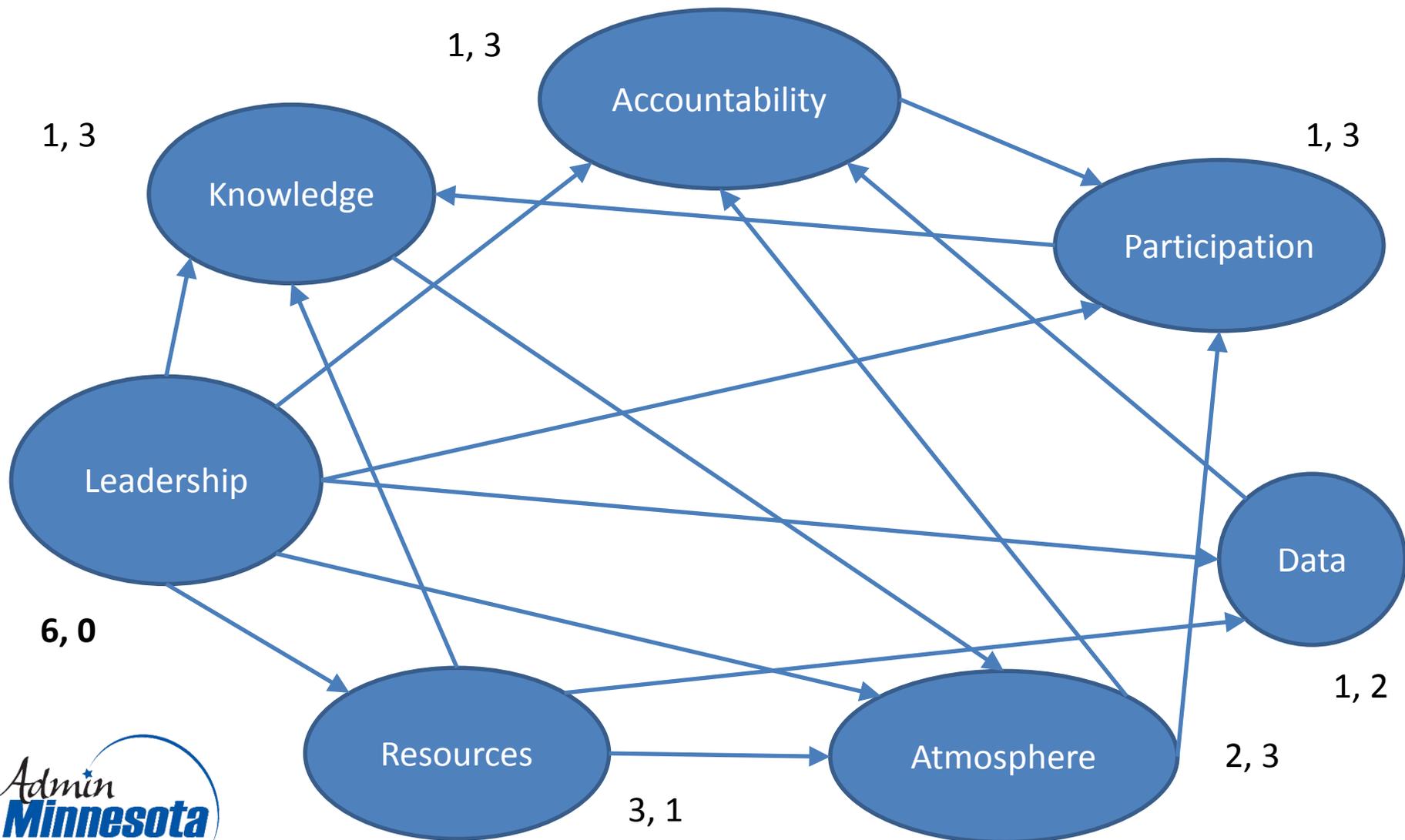
# Why use a Relations Diagram?

Helps us see possible root causes as a system

Tests whether a cause really impacts the effect

Helps identify **and rank** causes that may have the greatest impact

# Relations Diagram Example



# Relations Diagram (20 min.)



1. For each theme, draw an arrow showing which theme has the greatest influence
  - No two-way arrows!
  - Some themes may have no relationship
2. Record the number of “out” and “in” arrows for each category (# out, # in)
3. Team reports - identify top drivers

# 4. Identify, evaluate & select solutions

BACKGROUND / BUSINESS CASE	SOLUTIONS																
<p>STA</p> <ul style="list-style-type: none"> <li>• C</li> <li>• T</li> </ul> <p>CU</p> <p>AN</p>	<div style="text-align: right; margin-bottom: 10px;"> <span style="border: 1px solid black; border-radius: 50%; padding: 5px 10px; font-weight: bold;">E</span> </div> <div style="background-color: #4a7ebb; color: white; padding: 10px; border: 1px solid #4a7ebb;"> <ul style="list-style-type: none"> <li>• What solutions will solve the root cause(s)?               <ul style="list-style-type: none"> <li>➤ Brainstorming</li> </ul> </li> <li>• What solutions are best?               <ul style="list-style-type: none"> <li>➤ Impact/Difficulty Matrix; Criteria Decision Matrix</li> </ul> </li> <li>• What impacts (positive and negative) may result from implementing the solutions?               <ul style="list-style-type: none"> <li>➤ Impact Wheel; FMEA</li> </ul> </li> </ul> </div> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th style="width: 50%;">Proposed Date</th> <th style="width: 50%;">Actual Date</th> </tr> </thead> <tbody> <tr><td> </td><td> </td></tr> </tbody> </table>	Proposed Date	Actual Date														
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# Brainstorm Solutions (5 min.)

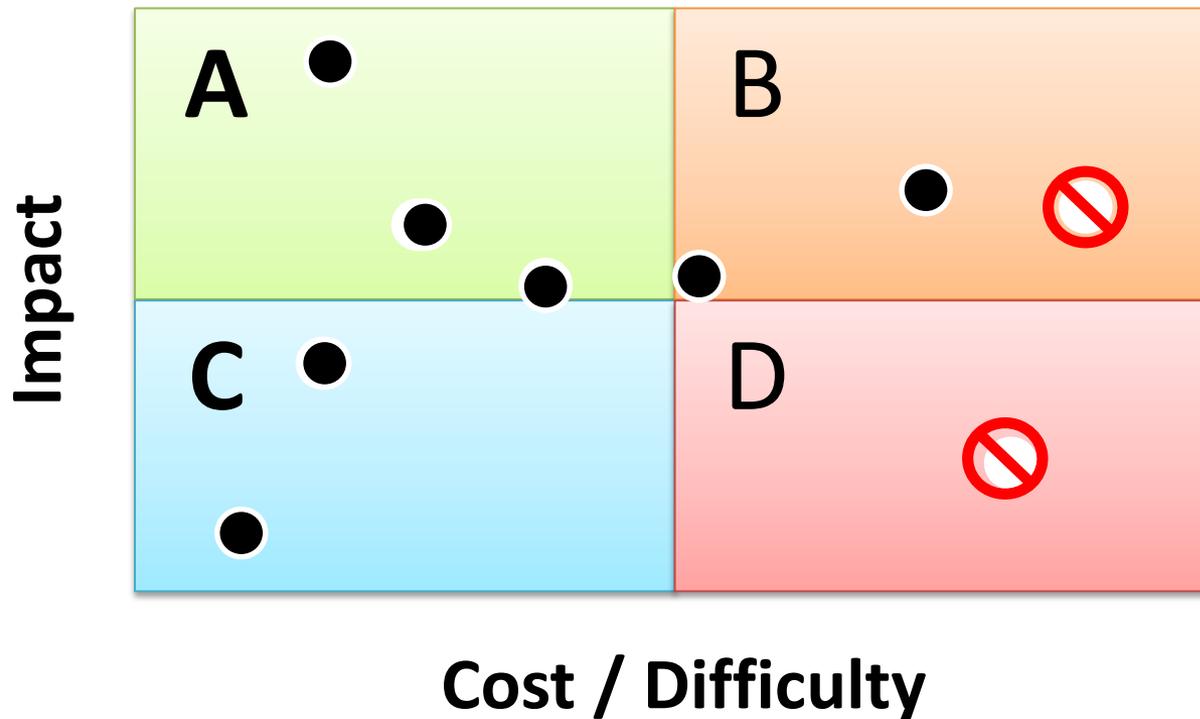


## Brainstorm solutions to root causes:

- Individually brainstorm possible solutions to root causes on why the hiring process is taking so long
- Record one idea per post-it.

# Impact/Difficulty Matrix

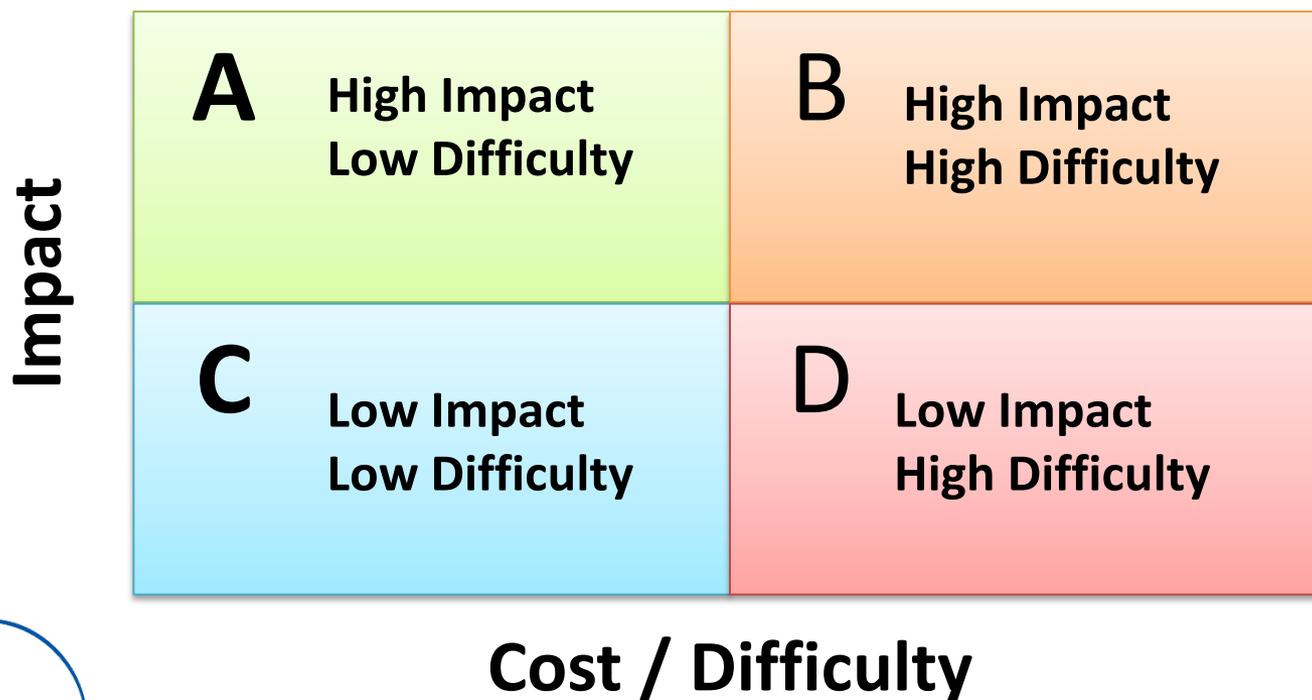
- A tool for prioritizing solutions



# Impact/Difficulty Matrix (10 Min)



- Place each idea in the most appropriate area of the Impact/Difficulty Matrix
- Record the solution you select in the A3



# 5. Identify & implement action items

## BACKGROUND / BUSINESS CASE

- What tasks do you need to complete? Include tasks to:
  - Mitigate risks
  - Identify and solve issues
  - Measure progress & results
  - Communicate changes, project status & results
  - Train managers and staff
- Who will be responsible for each task?
- When will the task be done?
- What resources are needed for each task?

## SOLUTIONS

### ACTION ITEMS

Action	Owner	Proposed Date	Actual Date

F

### RESOURCES/FOLLOW-UP

# 6. Monitor results



*Follow up is critical!*

# 7. Adjust & sustain standard work

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<b>ANALYSIS / ROOT CAUSES</b>	<b>METRICS/FOLLOW-UP</b>																																

- How and when will you check progress and performance (e.g., daily, weekly, 30, 60, 90-days)?
- How will you sustain new process standards?
- How will you communicate results and share what you learn with others?



*Follow-up is critical!*

# How can you incorporate problem solving into your daily work?



1. Pause before jumping to solutions
2. First, ask questions to understand your situation
  - What? When? Where? Who? How? Why?
3. Collect data
4. Ask Why 5 times to get to root cause
5. Engage other people in the process
6. Implement solutions that have the biggest impact and address root causes
7. Validate results
8. Learn from successes and failures
9. Celebrate improvement and learning

Group Discussion: Questions and Answers

# Complementary Initiatives



Link to Better Government for a Better MN:

<http://mn.gov/governor/initiatives/better-government/>

- Continuous Improvement
- Plain Language
- Results Based Accountability (RBA)
- Accessibility
- Diversity and Inclusion
- Data Governance



# We're a Resource for You!

- Minnesota Office of Continuous Improvement
  - Dept. of Administration, State of Minnesota
  - MN.gov/ci | CI@state.mn.us
- Geneva Martin | CI Coordinator
  - Office: 651.201.2562 | [Geneva.Martin@state.mn.us](mailto:Geneva.Martin@state.mn.us)
- Jennifer Hyser | CI Consultant
  - Office: 651.201.2567 | [Jennifer.Hyser@state.mn.us](mailto:Jennifer.Hyser@state.mn.us)
- Cathy Beil | Improvement Data Coordinator
  - Office: 651.201.2564 | [Cathryn.C.Beil@state.mn.us](mailto:Cathryn.C.Beil@state.mn.us)

# More Information

- Website: <http://mn.gov/admin/government/continuous-improvement/>
  - Course catalog, tools, contact information.
- Twitter: CI\_Minnesota
- Newsletter: <http://mn.gov/admin/lean/resources/newsletter/>
- Contact: [CI@state.mn.us](mailto:CI@state.mn.us)



**Thanks!**