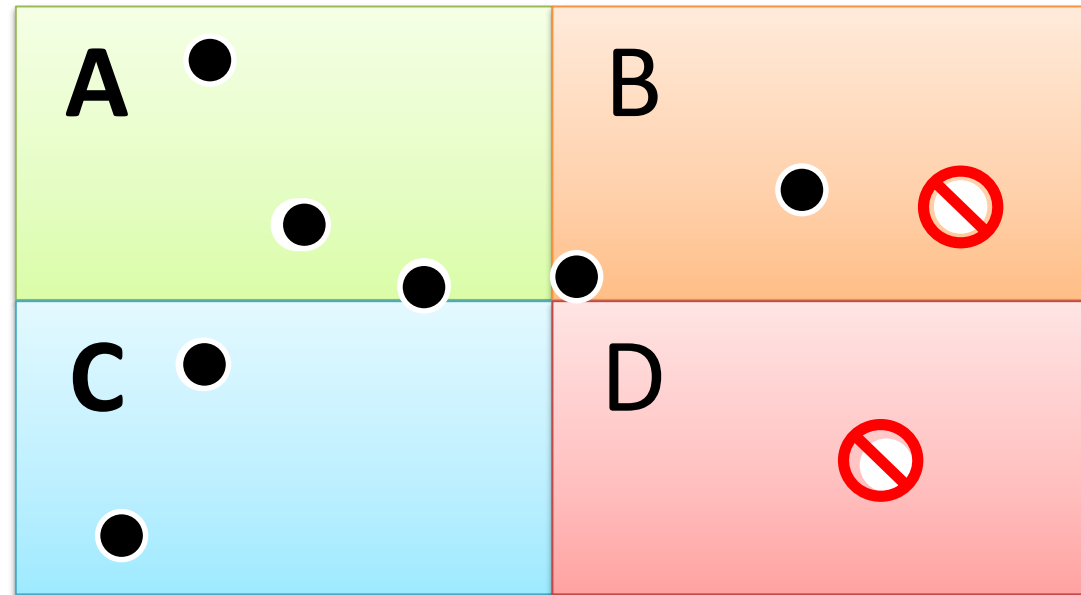# Problem Solving

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

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?
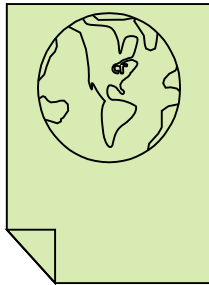
Why were the cleaning methods so abrasive?

Why?
Why?
Why?
.
.
.
Root Cause!

Five Why Analysis helps drive to source of the problem

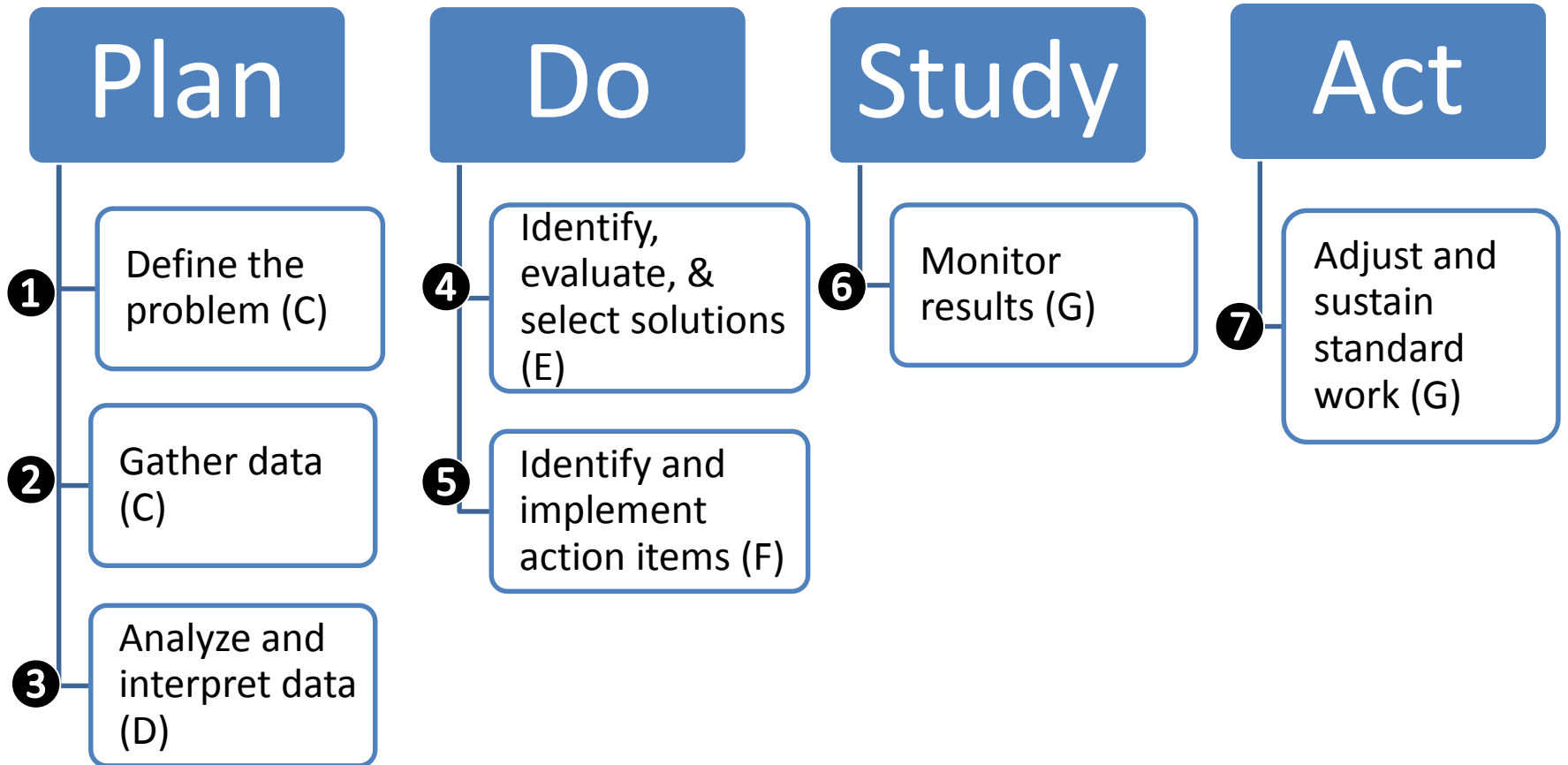The actual technique can take more or fewer iterations

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

A3 Problem Solving Tool

7 Step Problem Solving Process

Plan

① Define the problem (C)

② Gather data (C)

③ Analyze and interpret data (D)

Do

④ Identify, evaluate, & select solutions (E)

⑤ Identify and implement action items (F)

Study

⑥ Monitor results (G)

Act

⑦ Adjust and sustain standard work (G)

Note: Letters in parenthesis correspond to the A3 Problem Solving Tool section
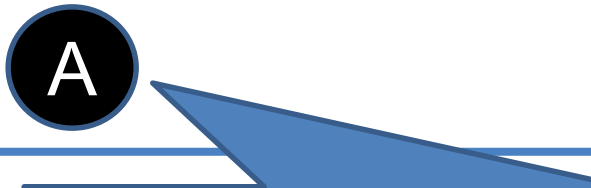
ABC Agency's Hiring Process

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)

BACKGROUND / BUSINESS CASE

(A)

STAKEHOLDERS
- Customers:
- Team Members:

CURRENT CONDITION

ANALYSIS / ROOT CAUSES

SOLUTIONS

METRICS/FOLLOW-UP

- What issue or problem do you wish to solve?
- Why is this issue important to solve now?
- What benefits do you anticipate from solving the problem (e.g., quality, timeliness, cost, customer/employee satisfaction)?

Stakeholders (5 minutes)

BACKGROUND / BUSINESS CASE	SOLUTIONS

STAKEHOLDERS
- Customers:
- Team Members:

B

CURRENT CONDITION

ACTION ITEMS

- 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)?

ANALYSIS / ROOT CAUSE

METRICS/FOLLOW-UP

1. Define the problem

You are here

You need to be here

Gap = Problem

Problem Definition Tools

Brainstorming

Affinity diagram
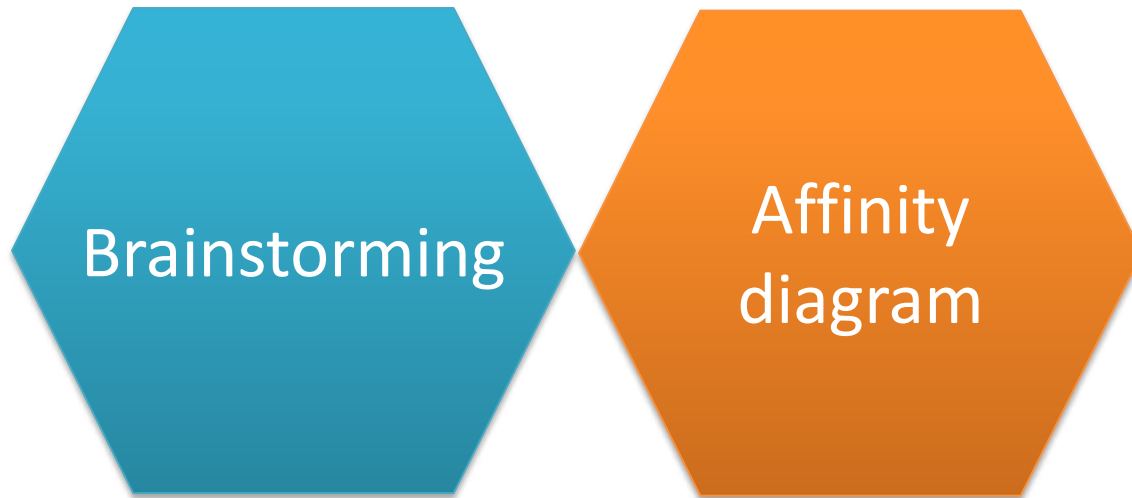
Brainstorming

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

Reduces Bias

Requires Diversity of Thought

Needs us ALL!

CI is about Equity, not Equality

Brainstorming Potential Problems

Time

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

Brainstorming Potential Problems

Cost

- Numerous sign offs

- Over-processing (exceed customer specs)

- Overproductions

- Too much inventory or documentation

- Bottlenecks/backlog

- Transportation
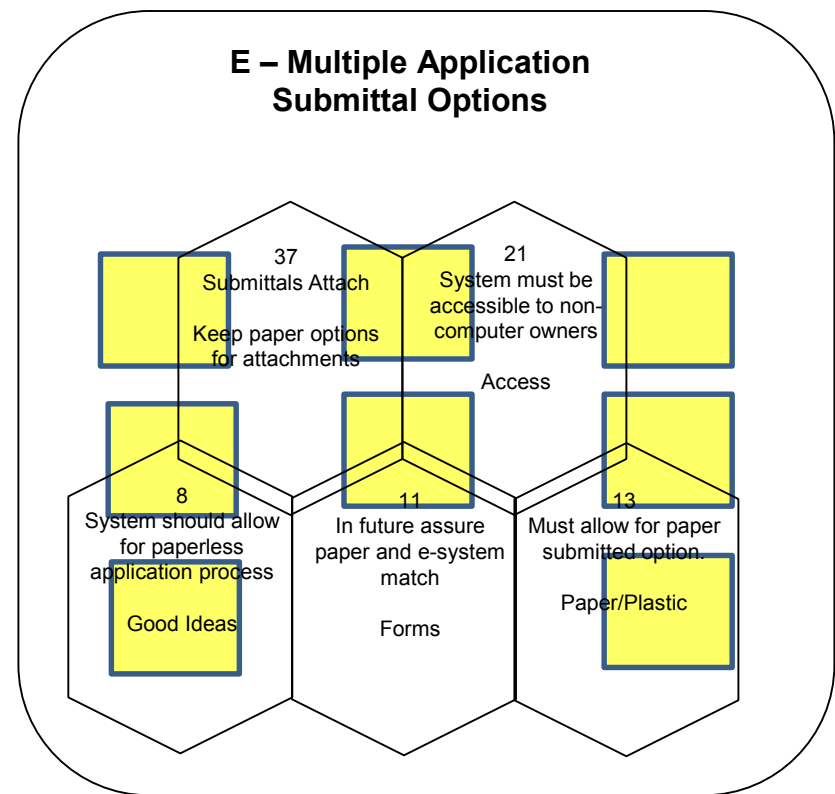
Brainstorming Potential Problems

Quality

- 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

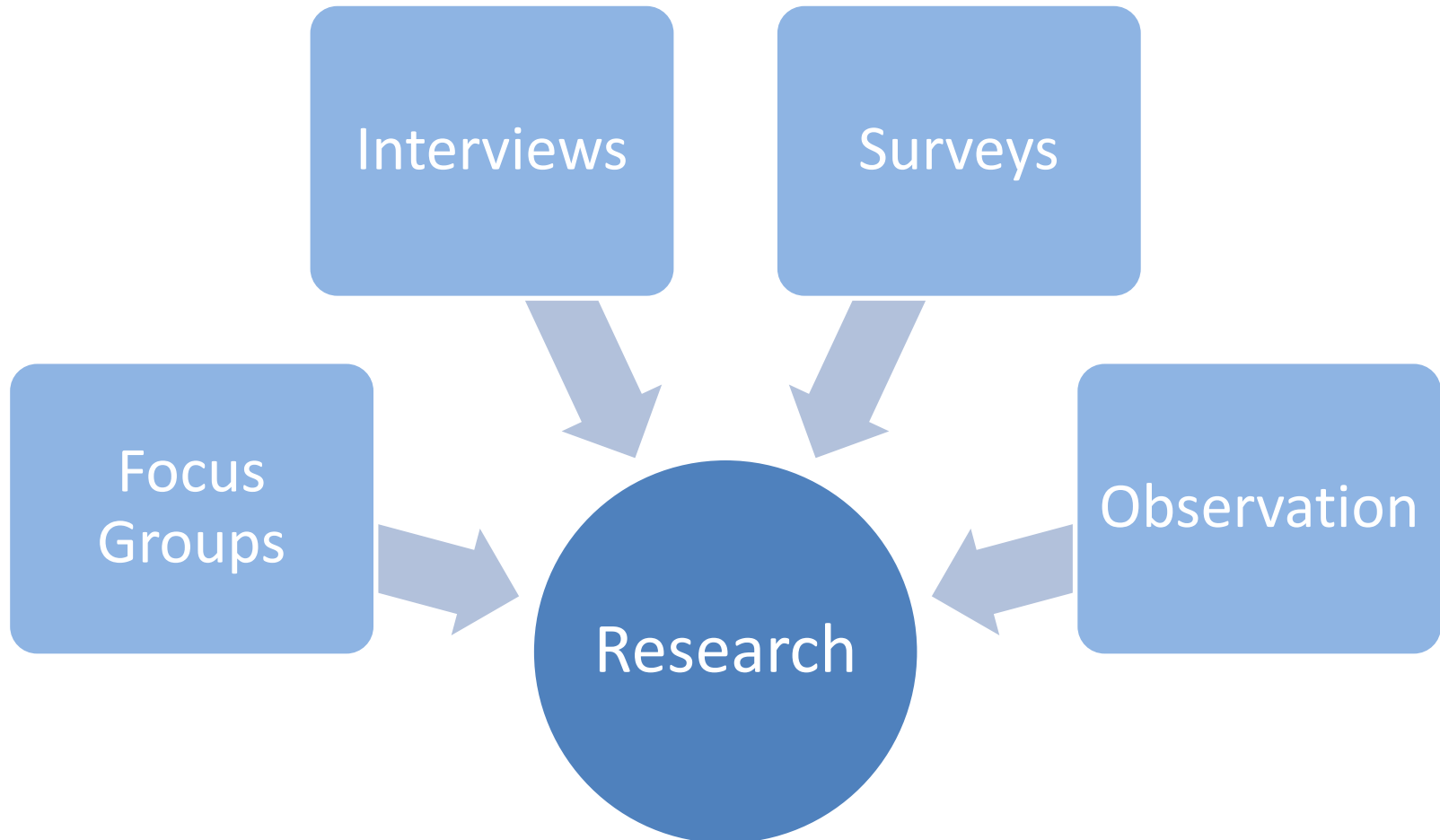# 2. Gather Data

What?

Who?

When?

How?

Why?

Where?
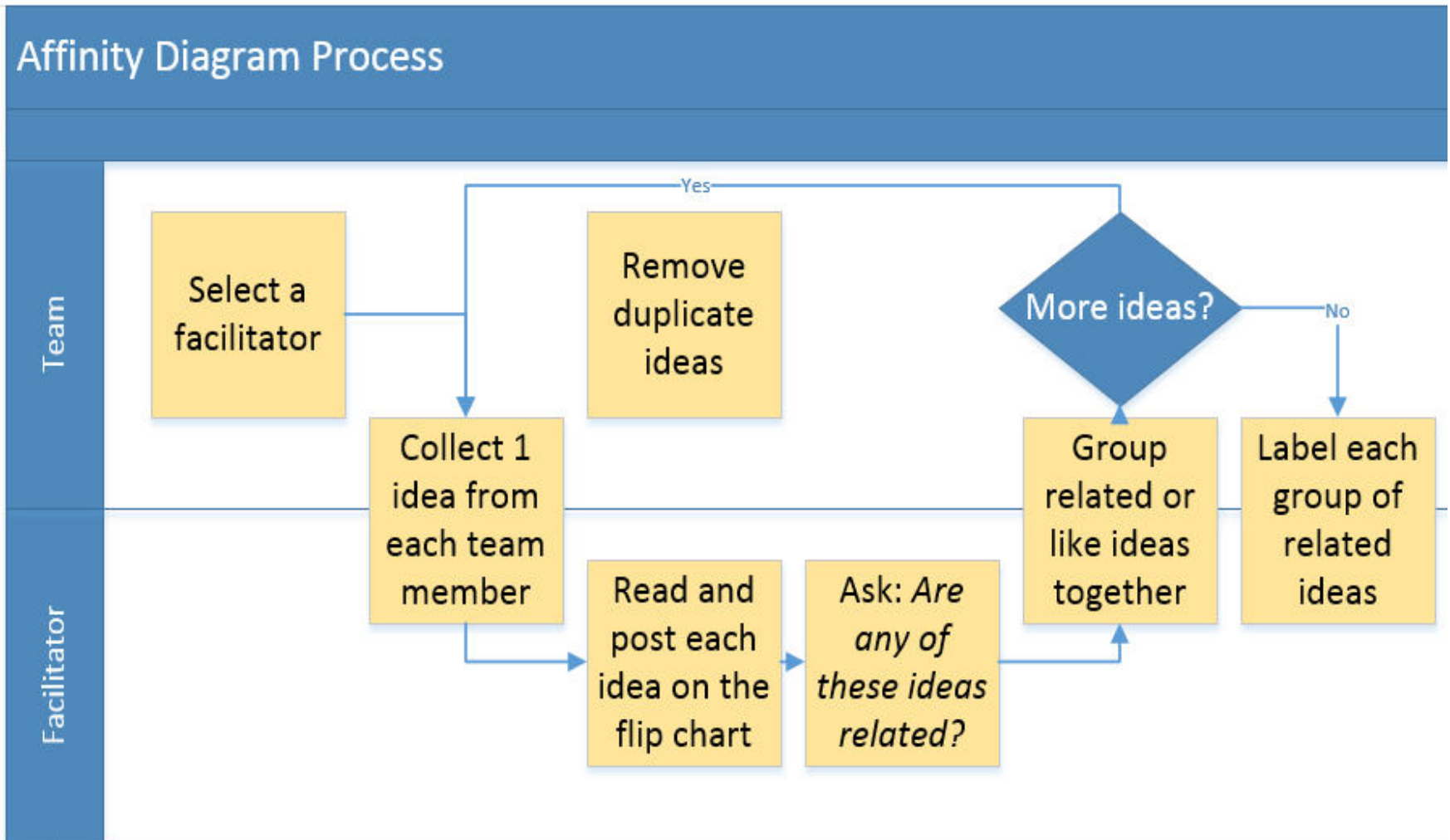
Voice of the Customer

- Who are our customers and key customers?

- What do they want/need?

- How are we gathering that information?

Customer Research Methods
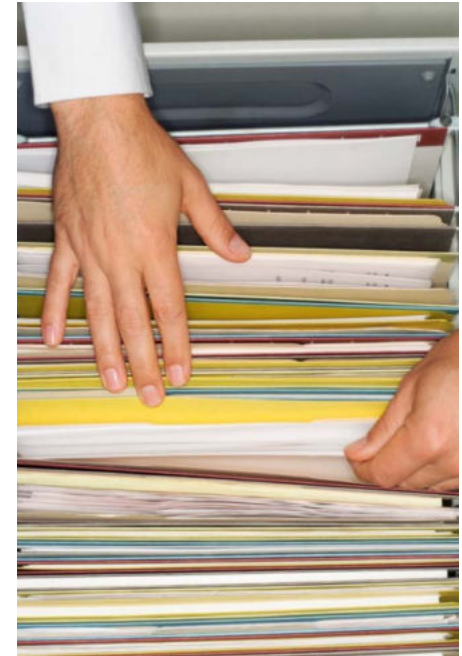
Program and Process Data

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 / BUSIN

STAKEHOLDERS
- Customers:
- Team Members:

CURRENT CONDITION

C

ANALYSIS / ROOT 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

BACKGROUND / BUSINESS CASE	SOLUTIONS

STAKEHOLDERS
- Customers:
- Team Members:

CURRENT CONDITION

ANALYSIS / ROOT CAUSES

D

- Why are the errors occurring?
  - o Use the simplest tool to show cause-and-effect down to root cause(s)
  - o Root cause analysis tools:
    - ➢ 5 Whys
    - ➢ Fishbone diagram and 5 Whys
    - ➢ Affinity and Relations diagrams

- Does our data verify the root causes?
  - o If not, a team may need to collect additional data to verify the root cause(s)

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

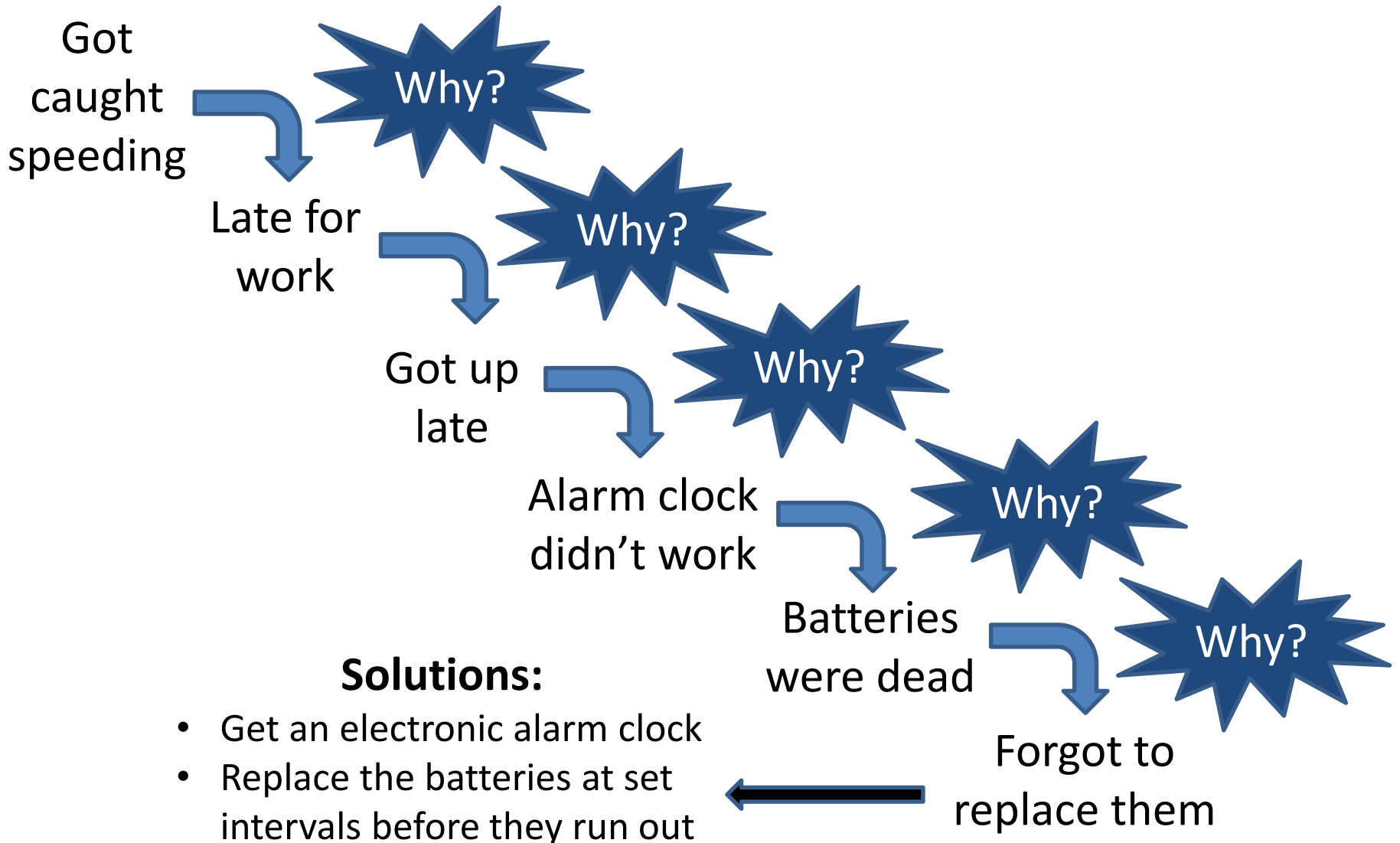Improves productivity: less headaches for staff $\rightarrow$ happier staff!

Save resources: solution may cost less than addressing symptoms
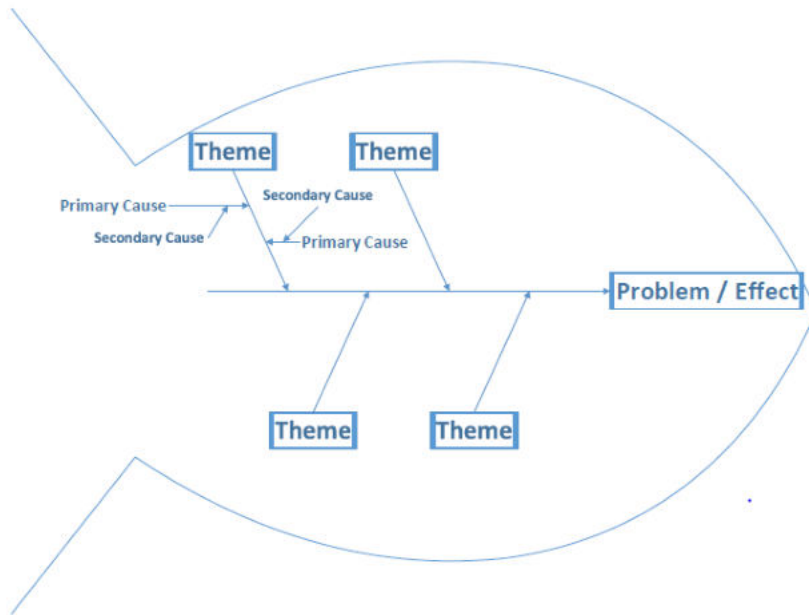
5 Whys

- 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

Got caught speeding

Why?

Late for work

Why?

Got up late

Why?

Alarm clock didn't work

Why?

Batteries were dead

Why?

Forgot to replace them

Solutions:
- Get an electronic alarm clock
- Replace the batteries at set intervals before they run out

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
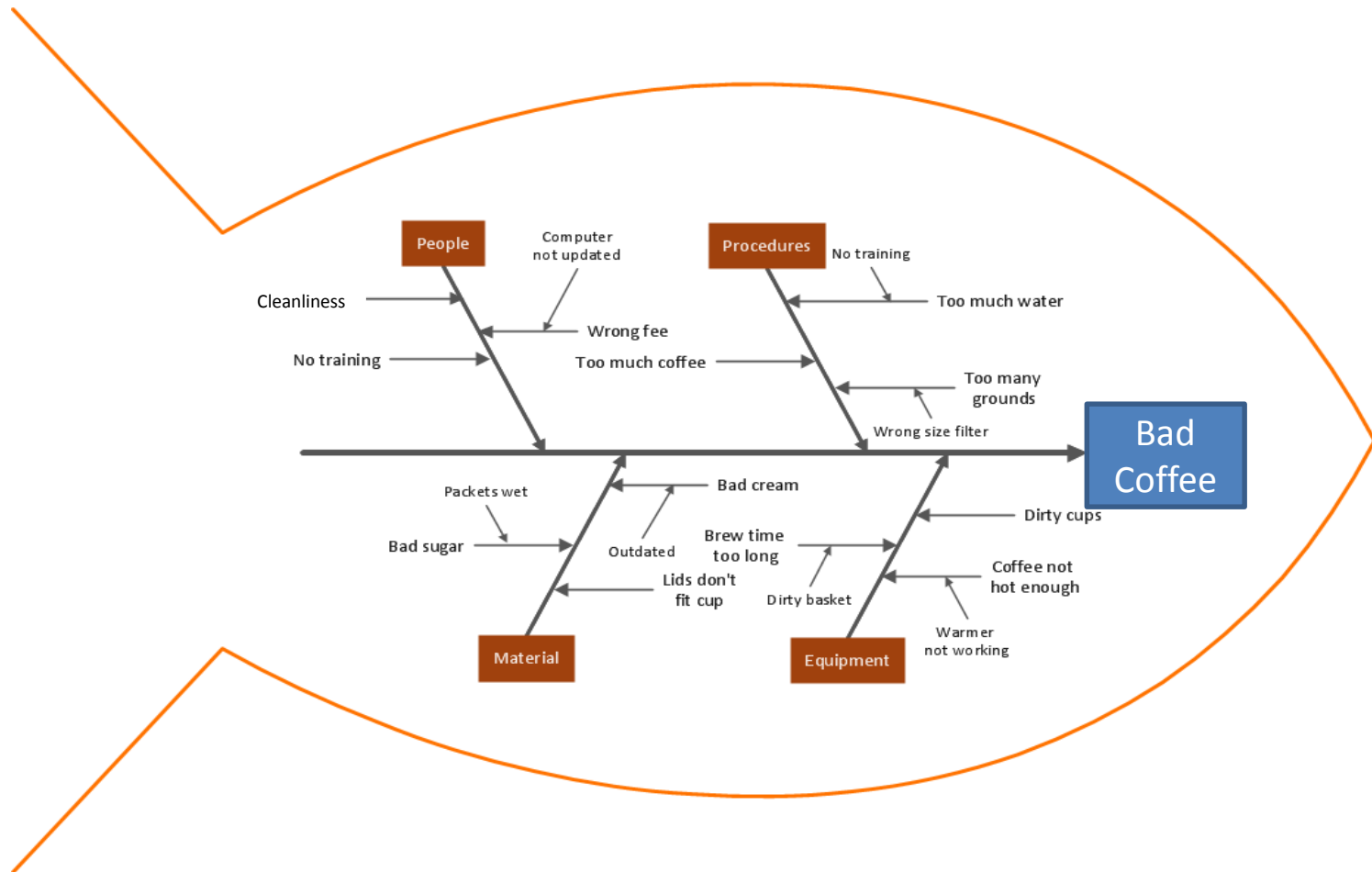 - Materials
  - Environment
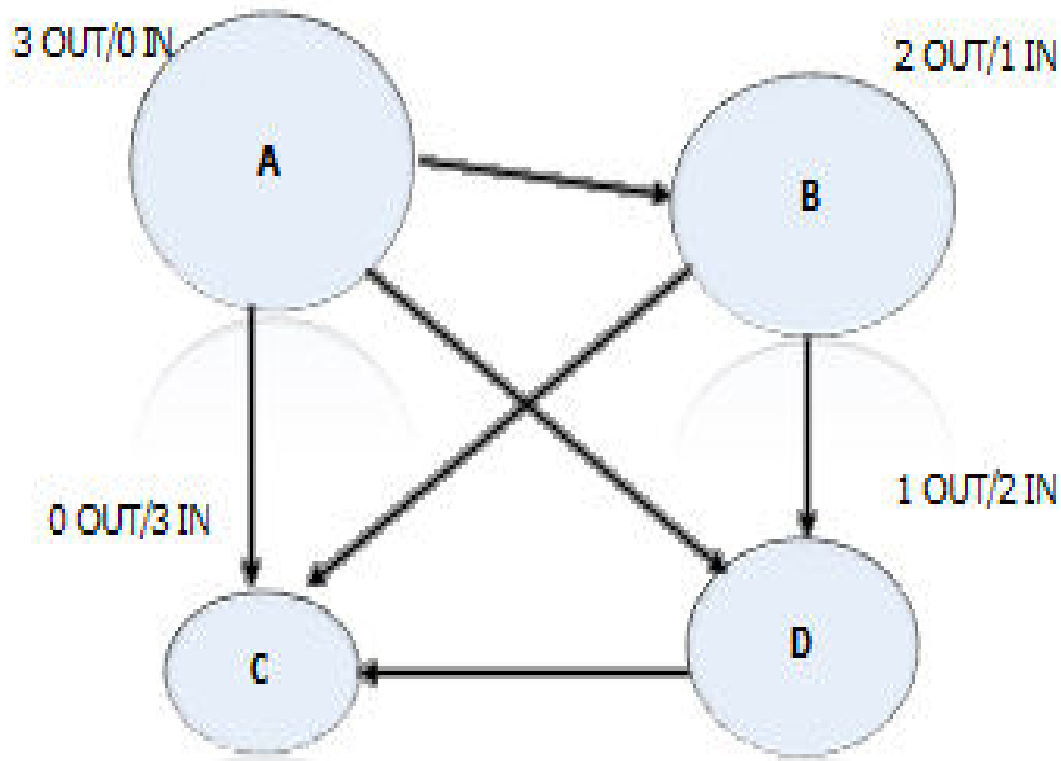 - Technology

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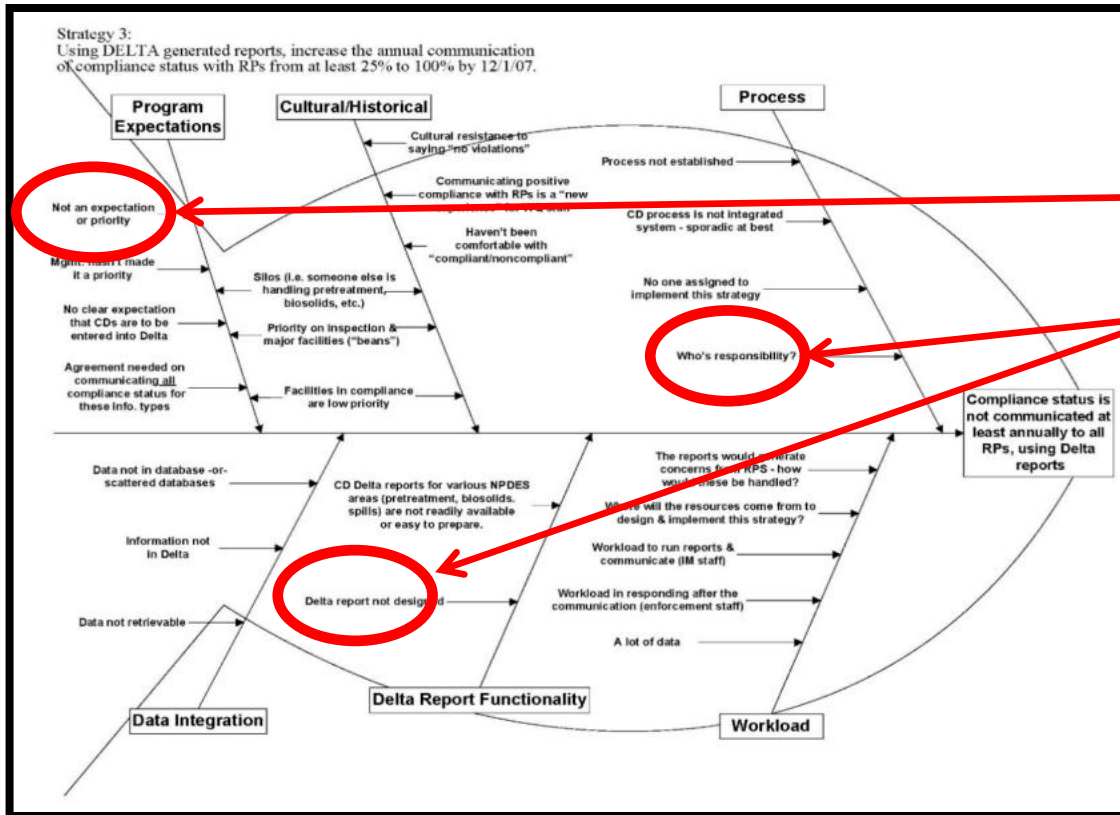
The same cause noted under multiple themes may be a root cause

Fishbone Diagram Example

Relations Diagram

- A team-based tool for identify key drivers or contributors to a problem

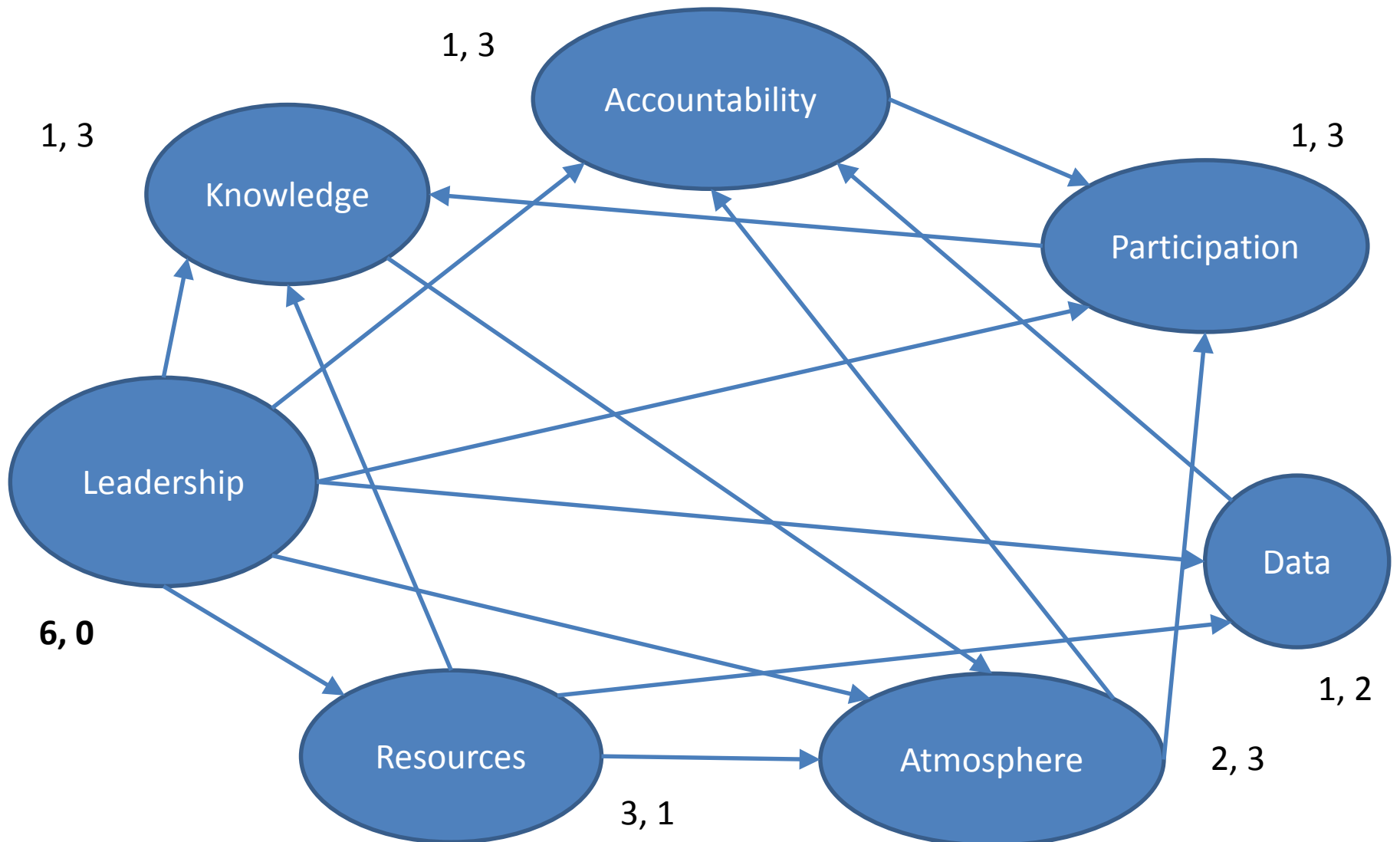- A cause category (theme) with many outward arrows may be a root cause

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

1, 3

Accountability

1, 3
Knowledge

1, 3
Participation

Leadership

Data

6, 0

Resources

Atmosphere

1, 2

2, 3

3, 1

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

E

STA

CUI

- What solutions will solve the root cause(s)?
  - ➤ Brainstorming
- What solutions are best?
  - ➤ Impact/Difficulty Matrix; Criteria Decision Matrix
- What impacts (positive and negative) may result from implementing the solutions?
  - ➤ Impact Wheel; FMEA

AN

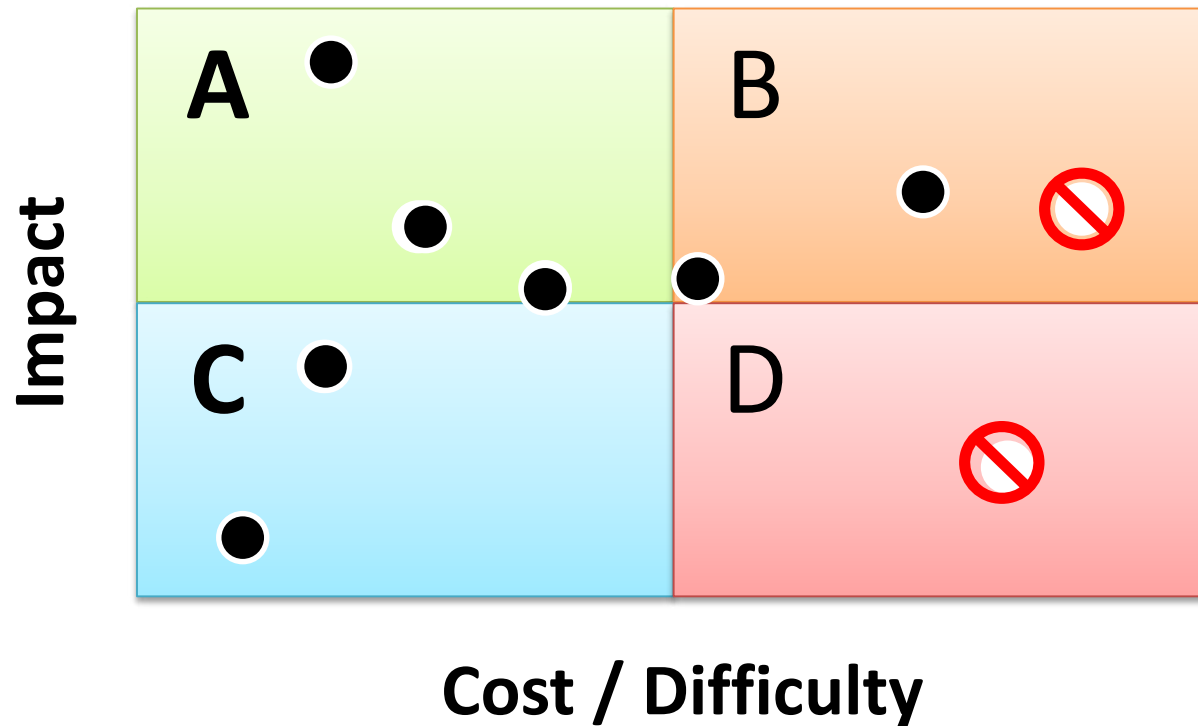|	Proposed Date	Actual Date

METRICS/FOLLOW-UP

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

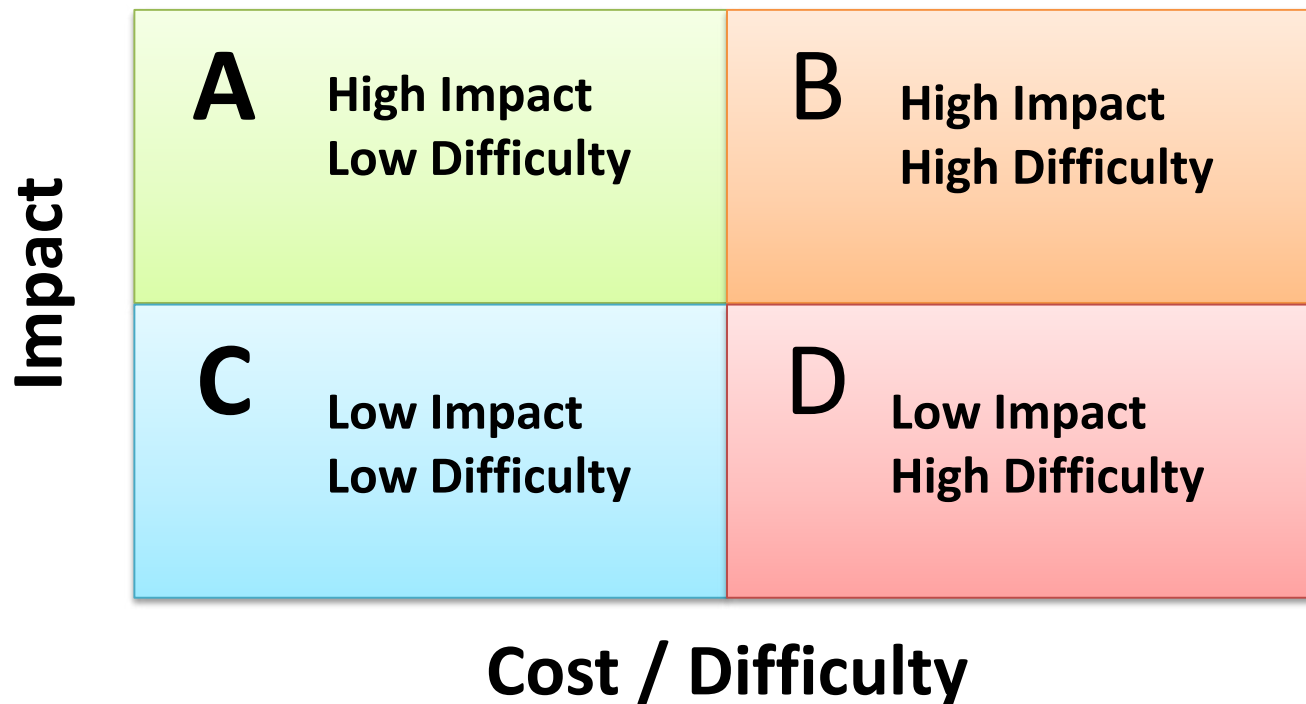- A tool for prioritizing solutions

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

Impact

A High Impact Low Difficulty	**B** High Impact High Difficulty
C Low Impact Low Difficulty	**D** Low Impact High Difficulty

Cost / Difficulty

5. Identify & implement action items

BACKGROUND / BUSINESS CASE

SOLUTIONS

ACTION ITEMS

Action	Owner	Proposed Date	Actual Date

F

RICS/FOLLOW-UP

- 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?

6. Monitor results

BACKGROUND / BUSINESS CASE	SOLUTIONS
STAKEHOLDERS	

STAKEHOLDERS
- Customers:
- Team Members:

CURRENT CONDITION

ANALYSIS / ROOT CAUSES

METRICS/FOLLOW-UP

- What metrics will you use to track progress and performance (validate results)?
- What data do you need?
- Who will you communicate results to?
- How will you communicate results?

	Proposed Date	Actual Date

G

Follow up is critical!

47

7. Adjust & sustain standard work

BACKGROUND / BUSINESS CASE

SOLUTIONS

STAKEHOLDERS
- Customers:
- Team Members:

CURRENT CONDITION

- 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?

	er	Proposed Date	Actual Date

ANALYSIS / ROOT CAUSES

METRICS/FOLLOW-UP

G

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