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Training Objectives

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

Course Overview

- Ground Rules
- Introductions
- Problem Solving Overview
- Define Problem and Approach
  - Stakeholder Analysis
  - Objective and Goal Statements
- Determining Root Causes of a Problem
  - Brainstorming
  - Affinity Diagram
  - Relations Diagram
- Determining Solutions
- Apply Tools to work
  - Action Planning

Introduction Activity

What are your objectives for attending today’s training?

Jefferson Memorial Video - Brainstorm all the different ideas they did/could’ve tried before implementing a final solution:
What is Continuous Improvement?

Continuous Improvement (CI) is an ongoing effort to improve products, services, and processes.

There isn’t just one way to solve a problem! **CI draws from many methods and problem solving tools to help us (figure out how to) work more efficiently and effectively.**

In the Minnesota Office of Continuous Improvement, we call the work we do “solving problems that change lives!”

Problem Solving – Why do it?

- **Value:** As a state agency we want to be operating as ‘lean’ as possible. Problem solving is a way to find opportunities to improve your work processes.
  - Save resources
- **Problem solving involves everyone:** from process owners to customers. Problem solving brings many forces together that exist separately for a desired outcome.
  - Makes work better for staff
  - Increases customer value and satisfaction
- **Problem solving links to customer needs:** recipient’s needs, tax payer value, process owners, and other stakeholders. If you are involved in a process you have experienced problems inside of it. All these different perspectives are important and will be invaluable to the success of your problem solving efforts.

There are many different tools and methodologies that can be used during a problem solving process. We are going to be focusing on and practicing a select few in today’s training.
<table>
<thead>
<tr>
<th>Question</th>
<th>Scientific Method</th>
<th>Lean</th>
<th>Six Sigma</th>
<th>Design Thinking</th>
<th>Tools</th>
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</thead>
<tbody>
<tr>
<td>What is the problem?</td>
<td>Form Question</td>
<td>Plan</td>
<td>Define</td>
<td>Empathize</td>
<td>Project Charter&lt;br&gt;Team Norms&lt;br&gt;SIPOC Diagram&lt;br&gt;Voice of the Customer Techniques&lt;br&gt;Immersion/shadowing</td>
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<tr>
<td>Why is it happening?</td>
<td>Make Hypothesis</td>
<td>Measure</td>
<td>Define</td>
<td></td>
<td>Swim Lane Map&lt;br&gt;Value Stream Map&lt;br&gt;Spaghetti Map&lt;br&gt;Process Analysis&lt;br&gt;Control Chart&lt;br&gt;Fishbone Diagram&lt;br&gt;Statistics&lt;br&gt;Relations Diagram</td>
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<td>How can we fix it?</td>
<td>Predict Outcome</td>
<td>Do</td>
<td>Improve</td>
<td>Ideate</td>
<td>Brainstorming&lt;br&gt;Idea Box&lt;br&gt;Ranking and Voting</td>
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<tr>
<td>Did we achieve our goal?</td>
<td>Analyze Results</td>
<td>Act</td>
<td>Control</td>
<td>Test</td>
<td>Control Plan&lt;br&gt;Standard Work&lt;br&gt;Post-Project Review&lt;br&gt;Storyboard&lt;br&gt;Visual Measures</td>
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Hiring Process Simulation

During today’s training, you and your team will be working through a problem solving process using different tools and strategies. During this process you will:

- Identify a project objective and goals
- Identify stakeholders and their needs
- Brainstorm possible causes for the problem and identifying cause categories by using an affinity diagram
- Learn and practice how to identify the root cause of a problem

Here is the situation:

ABC Agency is a statewide, public sector, union-based organization with 2,000 employees. Offices are open Monday through Friday from 8:00 a.m. to 4:30 p.m.

- Twenty-five percent of ABC’s employees are currently eligible to retire and another 25% will reach retirement age in the next five years.
- ABC filled 50 positions this past year and expects the number of new hires to double for the next seven years (100).
- On average it takes ABC four months from the time a manager or supervisor obtains authorization to hire a position to the time an offer letter is sent to the job candidate (80 days or 16 weeks).
- Because of the long time period, current employees appear to be overworked and the best candidates seem to be taking positions with other organizations.
- ABC Agency has also experienced an increase in the attrition rate of new hires in the past three years.

Objective:

- What are we trying to accomplish by solving this problem?

Goals:

- What are some of the high level goals you would want to achieve?
Evaluating the Current State

We want to base decisions on quantitative analysis as well and qualitative inputs. To understand if the implemented changes were effective, it is vital to understand the current state of the situation.

In regards to the Hiring Process Simulation, what data would you want to have to understand why things are happening the way they are?

Process Data

Data from the hiring process in the past has found that the entire process takes on average four months to fill a vacancy. Here is the high level hiring process and average time to complete each task:

1. Obtain authorization to hire (6 days)
2. Develop qualifications (10 days)
3. Determine posting requirements (4 days)
4. Develop recruiting plan (9 days)
5. Create requisition/position (6 days)
6. Post requisition/position and collect resumes (3 weeks)
7. Review Resumes (10 days)
8. Conduct Interviews (6 days)
9. Complete Pre-hire review (8 days)
10. Obtain salary approval (4 days)
11. Issue job offer (2 days)
12. Onboard employee (i.e., employee’s first day) (10 days)

Customer Feedback

Following are interviews from a few people that are part of the hiring process. This is how they are feeling about their current work environment:

<table>
<thead>
<tr>
<th>Meredith, Unit Manager</th>
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<tr>
<td>I had a critical position that I needed to fill ASAP. I really wanted to hire someone that would overlap with the person who was retiring, so I contacted HR to get the process moving. They didn’t give me a clear response for over a week and came back saying it wasn’t possible. Even when I finally picked someone after waiting so long, it was hard to just figure out their start date. One of my other positons, I have had to repost it three times because our first choice kept on taking different positions elsewhere. I can tell that my staff are overworked and feeling the pressure to take on more work even though it’s not their job. I want to give them answers to when there will be someone new soon, but now I don’t think they believe that we are trying to hire someone new at all.</td>
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<td><strong>Jasper, Human Resources Technician</strong></td>
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<tr>
<td><strong>Harvey, Technical Specialist</strong></td>
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<td><strong>Marvin, Hired within the last six months</strong></td>
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Stakeholder Analysis for Problem Solving

Stakeholders (also called customers) are defined as anyone who is a part of, effected by, or a recipient of, a process or service. Understanding their needs, experiences, and expectations, as part of understanding the current state, will allow you to solve the problem with them in mind. Use the following steps and grid to identify who the stakeholders are and their needs for Hiring Process Simulation:

1. Identify individuals or groups who stand to “gain” or “lose” as a result of the problem solving process.
2. Why do they want the problem solved?
3. What does “solved” look like to each stakeholder?
4. What do the stakeholders want from us?
5. What do we need from the stakeholders?

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Why do they want the problem solved?</th>
<th>What does “solved” look like to them?</th>
<th>What do they want from us?</th>
<th>What do we need from them?</th>
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Problem Statement

A problem statement is a complete description of the problem. A clear, specific picture of the problem will help to focus the problem solving effort and ensure that team members have a common understanding of the problem. A problem statement does not imply blame, or identify a solution.

A good problem statement should be:

- Concise: Your problem needs to be condensed down to one or two sentences. A reader of the project statement should be able to say “Now I understand the problem.”
- Specific: The problem statement should focus your thinking, research, and solutions toward a single issue.
- Measurable: Problems can be measured in terms of degree (how much) and frequency (how often). The strongest problem statements incorporate measurable aspects of both the degree and frequency of the problem.
- Identifiable: Specify what is impacted: The problem statement should identify the customers affected by the problem.

Now that you have more background information available to you, what is your problem statement? What are you trying to solve?

Determining the Root Cause of the Problem

Brainstorming

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

For a problem solving project, brainstorming is used to identify possible contributors or causes of a problem, and to identify possible solutions to root causes of the problem. When brainstorming, use methods that balance contributions from introverts and extroverts, such as silent brainstorming.
PROBLEM SOLVING

Brainstorming Options:

- Silent. Write down first, then share (favors introverts)
- Open/Popcorn. Call out ideas (favors extroverts)
- Structured. Provide themes for brainstormed ideas, like the categories in a fishbone diagram: facilities/equipment/tools, communication, people (training, roles, behaviors), process/procedures/policies, materials, and environment
- Reverse. Brainstorm how to make matters worse!
- Analogy. Relate a story to the issue(s) at hand, draw on parallels

Brainstorming Rules:

- Rapid generation is the aim. Strive for quantity.
- Be creative! There is no such thing as “wild” or “bad” idea.
- Defer judgement.
- Clarify, combine, and build on ideas.

To assist with brainstorming potential causes, here are some examples of problems that might be happening in your process:

<table>
<thead>
<tr>
<th>Problem/Cause</th>
<th>Effect</th>
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| **Time**      | • Waiting: hand-off delays  
• Inefficient or illogical work flow  
• Unreliable equipment or limited equipment capacity  
• Process complexity  
• Motion     |
| **Cost**      | • Numerous sign-offs  
• Over-processing  
• Overproductions  
• Too much inventory or documentation  
• Bottlenecks/backlog  
• Transportation     |
| **Quality**   | • Errors  
• Rework  
• Defects  
• Unclear roles and responsibilities  
• Vague customer requirements     |

Task: Take five minutes to silently brainstorm all possible causes and contributors to the hiring process problem. Record one idea per Post-It®.
Affinity Diagram

An affinity diagram is a tool for simplifying and communicating a large number of ideas and feedback by grouping similar or related ideas into themes.

For a problem solving project, the affinity diagram is used in combination with the relations diagram. The relations diagram helps a team rank which theme (or root cause) has the strongest influence over other causes. When you solve the cause with the greatest influence on other causes, you typically resolve or minimize the impact of related causes. The relations diagram also helps a team see the problem from a systems perspective, which enhances the team’s understanding of the subject area and ability to make future improvements.

You have flexibility and discretion in how you group related ideas. Below is one approach you may use:

1. Facilitator instructs team members to record one idea per Post-It® note during the brainstorming exercise.
2. Using a round-robin approach, the facilitator collects two idea (e.g., causes and contributions) from each person.
3. Facilitator instructs team members to remove ideas from their list that are the same as ideas posted.
4. Facilitator reads aloud each idea and places it on a flip chart or white board.
5. Facilitator asks the team, “Do you see any ideas that relate to each other?” Facilitator places related ideas next to each other.
6. Facilitator follows the round-robin approach until all unique ideas are posted and works with the team to group related ideas.
7. Once all ideas are posted, the facilitator records the team’s identified theme at the top of each group of ideas.
PROBLEM SOLVING

Task: With your team, create an affinity diagram with all the causes you brainstormed as individuals. You will have 15 minutes to create your affinity diagram and establish what you think are the main causes/themes of this problem.

Relations Diagram

The purpose of the relations diagram is to identify which themes and root causes have the strongest influence or other causes. It also helps to see the interrelationships among causes.

Start with a list of brainstormed problems/causes. If the list is long (more than 10 causes), use the affinity diagram to identify themes or groups of related causes.

1. Record each theme or idea on a large Post-It® note and place notes in a large circle on a flip chart or marker board.
2. Start at the top of the circle with “Theme 1” and work your way clockwise through the remaining themes as they relate to Theme 1. Ask: Does Theme 1 have a stronger influence on Theme 2 or does Theme 2 have a stronger influence on Theme 1?
3. Draw arrows from the cause or theme that has the greater influence to the theme influenced. When themes influence each other, choose the stronger influence (no two-way arrows!). If there is no relationship among two themes (i.e. no influence) do not draw an arrow.
4. Then ask, “Does Theme 1 have a stronger influence on Theme 3 or does Theme 3 have a stronger influence on Theme 1?” Proceed until you have recorded the relationship of all remaining themes to Theme 1.
5. Follow steps 2 through 4 with “Theme 2” until all relationships among remaining themes have been recorded for “Theme 2”.
6. Continue in a clockwise fashion until you have recorded all relationships with each subsequent theme.
7. Count the arrows going out and the arrows going in for each theme. Record as (<# of arrows out>, <# of arrows in>.
8. The themes with the most arrows out and fewest arrows in will be root causes or drivers. The ones with the most arrows in will be key outcomes, results, or symptoms of the root causes.
Task: Using the instructions above to guide you, create a relations diagram using the themes that you established in the affinity diagram. Use the data you have seen and different causes you brainstormed when discussing which theme has a greater influence over the other.

Steps for After Today’s Training:

- We challenge you after today’s training to identify some solutions and dig deeper about what would make those solutions possible. Use the directions to help you through the process!
- Additionally, we challenge you to create a personal action plan of what you want to implement back in your workplace after taking today’s training.

Identifying Solutions

Task: Brainstorm possible solutions to the root cause your team discovered on why the hiring process is taking so long.

Brainstormed Solutions:
As you work through your solutions, consider the following about what it will take for implementation:

- *Is the solution suitable? Will this solution produce the desired results?*
- *Is the solution feasible?*
- *Is the solution acceptable? Is the solution going to be cost-effective?*
- *What do we see happening if this solution is implemented? Who will be effected? Will there be any consequences for this solution being implemented?*

<table>
<thead>
<tr>
<th>Option</th>
<th>What will it do?</th>
<th>What will it take to be implemented?</th>
<th>What other steps would need to be taken if this solution were implemented?</th>
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Personal Action Plan

Create an action plan! Write down one to three goals that you would like to work on in the next three to six months. Choose goals based on:

1. What you want to apply from this class
2. What you would like to learn more about
3. What impact this could have your work and/or

Goal 1:
- Action steps:
- Other people or resources needed:
- Due date:

Goal 2:
- Action steps:
- Other people or resources needed:
- Due date:

Goal 3:
- Action steps:
- Other people or resources needed:
- Due date:
For More Continuous Improvement Training, Resources, and our Newsletter:

- CI Homepage:
  [http://mn.gov/admin/government/continuous-improvement/](http://mn.gov/admin/government/continuous-improvement/)

- Additional Resources:
  [http://mn.gov/admin/continuous-improvement/resources/](http://mn.gov/admin/continuous-improvement/resources/)

- Additional Training Available:
  [http://mn.gov/admin/continuous-improvement/skills-development/](http://mn.gov/admin/continuous-improvement/skills-development/)

- Sign-up for our CI Newsletter:
  [http://mn.gov/admin/continuous-improvement/resources/newsletter/](http://mn.gov/admin/continuous-improvement/resources/newsletter/)

We offer three standard courses: Introduction to CI, Problem Solving, and Process Improvement Measurement. Our training programs equip Minnesota’s state government workforce with the tools of continuous improvement. Courses are offered for public sector employees only and are free of charge. Register through the Employee Self-Service website.

For state agencies, we also offer direct CI training to your project teams and work units. Contact us at ci@state.mn.us for details!