Training Objectives

- Develop an understanding of major continuous improvement methods
- Apply continuous improvement concepts to a real world case study
- Learn two tools that can be used right away for individual or team process improvement

Course Overview

- Housekeeping
- Introductions
- Overview of MNCI and CI
- Use best method for solving problems
  - Lean
  - Six Sigma
  - Design Thinking
- Hands-on practice with two tools that can be used right away in your work
- Case study
- Personal action plan

Introduction Activity

What is your objective for attending today’s training?

How do you approach solving a problem?
Minnesota Office of Continuous Improvement

- The Minnesota Office of Continuous Improvement (MNCI) was established in 2007 as an initiative within the Department of Administration. It was originally called the “Enterprise Lean Program,” as part of Governor Tim Pawlenty’s “Drive to Excellence” initiative.
  - The program’s first goal was to introduce within MN state government organizational improvement methodologies that were commonly used by leading businesses worldwide.
- MNCI is still part of the Department of Administration and now associated with Governor Dayton’s Better Government for a Better Minnesota initiative.
- MNCI focuses on three improvement areas:
  - ensuring results (project management and implementation; project tracking; awards)
  - building capacity (offer foundational CI trainings to all state and other public sector employees), and
  - creating culture (leadership training; culture assessments) at the enterprise-level.
- Many other agencies have various levels of CI staffing or initiatives in place.
- The Continuous Improvement Advisory Council (CIAC) consists of members from most all cabinet level agencies. They represent more than 30,000 state employees. You can find your agency’s CIAC member listed on our website.

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.**

To do this, CI work focuses on culture, customers, and data.

**Culture of CI**

An organizational and team culture can either encourage or discourage a culture of continuous improvement. A CI Culture:

- Wants to see problems
- Supports those who identify them
- Works to fix problems without blame
- Includes customers and staff in improvements
- Celebrates fixing problems
Diversity and Inclusion

A culture of continuous improvement also embodies diversity and inclusion. CI supports the inclusion of staff and customers based on experience with the process and regardless of background. In CI, it’s not just a matter of wanting to welcome everyone, but everyone is needed.

Customer Focus – Design and improve services based on the customer needs and preferences. Provide what customers need, when they need it, and how they want it. When talking about a customer or stakeholder, they are defined as anyone who is part of or effected by the process. These customers can be internal, external, and end-users.

Who are your current (both internal and external) customers?

How do you know what your customers want?
Data Driven Decisions – Base decisions on quantitative analysis as well as qualitative inputs, like anecdote or intuition. We need data AND, not just data. Validate results with data. To understand if the implemented changes were effective, it is important to understand the current state of a situation. When it comes to data, there may be data you already keep track of. In other cases there may be data that you need to go collect from somewhere new. With that being said, there are many different types of data and ways to collect it:

Data Collection Methods:

Types of Data:

Quantity: how much do 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?
Continuous Improvement Methodologies

There are many strategies and methods to use when approaching a problem. Different methods for process improvement have been developed over time to best meet the needs of an organization, their goals, and desired outcomes. There are many different methodologies and tools that can be drawn from when approaching a problem. Here are three examples of approaches used in continuous improvement:

- **Lean** is a method that focuses on eliminating waste from a process and uses a foundation of W. Edwards Deming’s Plan-Do-Study-Act (PDSA) model for improving processes.

- **Six Sigma** is a data-driven approach to eliminate defects and deviation from a process. It uses the linear approach of Define-Measure-Analyze-Improve-Control (DMAIC) to identify the root cause of a problem to determine the source of errors.

- **Design Thinking** looks at the customer’s perspective from the start to the end of an experience. It uses a divergent approach of Empathize-Define-Ideate-Prototype-Test, to design a solution focused towards creating a preferred customer experience.

Regardless of what approach is used to try to solve a problem, there should be a continuous cycle of asking “What is the problem?” “How can we fix it?” “Did our changes work?” and “What adjustments still need to be made?”

The following table displays how Lean, Six Sigma, and Design Thinking all follow a similar pattern of the Scientific Method. Though each was developed for different reasons, they still follow Scientific Method’s process, of forming a question, making a hypothesis, predicting the outcome, conducting an experiment, and analyzing the results.
<table>
<thead>
<tr>
<th>What is the problem?</th>
<th>Scientific Method</th>
<th>Lean</th>
<th>Six Sigma</th>
<th>Design Thinking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form Question</td>
<td>Plan</td>
<td>Define</td>
<td>Empathize</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Why is it happening?</th>
<th>Scientific Method</th>
<th>Lean</th>
<th>Six Sigma</th>
<th>Design Thinking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Make Hypothesis</td>
<td></td>
<td></td>
<td></td>
<td>Define</td>
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</table>

<table>
<thead>
<tr>
<th>How can we fix it?</th>
<th>Scientific Method</th>
<th>Lean</th>
<th>Six Sigma</th>
<th>Design Thinking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Predict Outcome</td>
<td>Do</td>
<td>Improve</td>
<td>Ideate</td>
<td></td>
</tr>
<tr>
<td>Conduct Test</td>
<td>Study</td>
<td></td>
<td>Prototype</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Did we achieve our goal?</th>
<th>Scientific Method</th>
<th>Lean</th>
<th>Six Sigma</th>
<th>Design Thinking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analyze Results</td>
<td>Act</td>
<td>Control</td>
<td>Test</td>
<td></td>
</tr>
</tbody>
</table>

What adjustments still need to be made?

### Additional information on these methodologies:

**Lean**
- [http://www.lean.org](http://www.lean.org)
- [http://theleanstartup.com/principles](http://theleanstartup.com/principles)
- [https://deming.org/management-system/pdsacycle](https://deming.org/management-system/pdsacycle)

**Six Sigma**
- [https://www.isixsigma.com/](https://www.isixsigma.com/)
- [https://www.isixsigma.com/dictionary/dmaic](https://www.isixsigma.com/dictionary/dmaic)

**Design Thinking**
- [http://dschool.standford.edu](http://dschool.standford.edu)
- [http://ideo.org](http://ideo.org)
Tool 1: Process Mapping

Process mapping is a tool that allows you to create a visual representation of a process. It displays the tasks and people/areas involved in a process.

Benefits of creating a process map:

- Visually displays how a current process is happening
- Displays the flow of a work process (helpful when explaining a process to a new employee)
- Identifies how many people/areas are a part of a single process
- Helps to identify where there are unnecessary steps, rework, or confusion in a process.

Here is an example of a workplace process (processing payroll):

For this example, the process begins with an employee completing their time card. The next task is for their manager to review their timecard and make a decision to either approve it or not. If not approved, it would go back to the employee to update as needed. If approved, the next task is for human resources to check their pay status and then enter it into their payroll system. Next, the accounting area would process their payroll, and end with the employee getting paid.
As a team, use the following steps to construct a process map:

1. Define the process boundaries. Identify where the process starts and stops.
2. Determine what roles (people/department/area) are part of the process. Write each of them down on individual post-it notes (its fine to add more as you come across them).
3. Draw a column on the left side of the sheet, with a label of “role” at the top. Place each of the roles in that column.
4. Separate each role with their own row (lane). The actions taken by each role will be placed within their specific lane.
5. What is the first step? Write it down on its own post-it note, and place in the appropriate lane.
6. For the process, go through the sequence of steps (giving them each their own post-it) from start to ending point. Place the step in the appropriate role’s lane, moving from left to right across your page. If any additional roles get added to the process, write them down and give them their own lane.
7. Wait to draw arrows until all pieces have been written down and placed accordingly.
8. If you come to a point where a decision needs to be made, create a post-it with a “yes” and a “no” and place in the role’s lane of who would make the decision. Display with arrows, what the decision would lead to (refer to photo above for example).
9. Study the flow chart. Ask yourself: is there a step or person missing? Are there redundant or confusing activities? Is every step necessary? Is rework happening? If a person didn’t know anything about the process, would they be able to pick up your process map and understand what is happening and why?

What is your process?

Brainstorm: What is your current process for going grocery shopping?
Process Mapping Reflection

What current process do you have at work that could benefit from being mapped?

What positive and negative outcomes could come about from doing a process map?
Tool 2: 5S

5S is a simple method for creating a clean, orderly, high performance work environment. It provides a system for eliminating waste that results from a poorly organized work area (e.g. wasting time looking for information/documents/office supplies).

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sort</td>
<td>Remove items not needed</td>
</tr>
<tr>
<td>Set in Order</td>
<td>Establish a place for every item and keep items in their place</td>
</tr>
<tr>
<td>Shine</td>
<td>Keep the area clean</td>
</tr>
<tr>
<td>Standardize</td>
<td>Create a routine to sustain the first 3 Ss</td>
</tr>
<tr>
<td>Sustain</td>
<td>Put structures and measures in place to maintain and improve the first 4 Ss</td>
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</tbody>
</table>

How could you 5S the process you just mapped out?

How can you apply 5S to areas of your work?
Case Study

Gathering from what has happened in training so far and from other experiences you have, how would you approach the following problem?

**Scenario:** There is a state agency that is producing permits for the public. Currently, the process from the time that the customer is requesting a permit, for it to be processed, and then approved is taking too long according to customer’s expectations. Customers are frustrated with how long the process is taking. The manager is placing pressure on their employees to produce permits at a faster rate, but this has caused for there to be more rework. The employees who are a part of the process are experiencing poor morale and are feeling overworked from the demand to produce more at a high quality rate.

Refer back to the chart on page 6. CI (regardless of what methodology or tools applied) is a continuous cycle of analysis and improvement. Keep this concept in mind as you are answering the following questions:

1. How would you approach this problem?

2. What data do you need to collect?

3. What would your project goals be?
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 you feel like this could have on the work you do/organization you work for

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:
## Additional CI Concepts and Tools

<table>
<thead>
<tr>
<th>What is it?</th>
<th>How does it work?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>5S</strong></td>
<td>A method to organize work areas:</td>
</tr>
<tr>
<td>1. Sort (remove what is not needed)</td>
<td></td>
</tr>
<tr>
<td>2. Set in order (organize needed items)</td>
<td></td>
</tr>
<tr>
<td>3. Shine (clean work area)</td>
<td></td>
</tr>
<tr>
<td>4. Standardize (write standards for above steps)</td>
<td></td>
</tr>
<tr>
<td>5. Sustain (regularly apply the standards)</td>
<td></td>
</tr>
<tr>
<td><strong>8 Wastes</strong></td>
<td>Descriptions of non-value added components in our work processes. Wastes include: Defects, Overproduction, Waiting, Non-utilized staff talent, Transportation, Inventory, Motion, and Extra processing</td>
</tr>
<tr>
<td><strong>A3</strong></td>
<td>A one-page document used to understand and solve a problem, or plan and communicate an improvement project. An A3 incorporates PDSA and refers to the paper size (11”x17”).</td>
</tr>
<tr>
<td><strong>Batching</strong></td>
<td>Batching is when we wait for a certain amount of items (i.e., batch) or time before performing the next step in the process. In most instances, batching increases wait time for customers, because it holds up work that is ready to move to the next process step.</td>
</tr>
<tr>
<td><strong>Human-centered Design</strong></td>
<td>A creative approach to problem solving. It is a process that starts with the people you are designing for and ends with new solutions that are tailor made to suit your customer’s needs.</td>
</tr>
<tr>
<td><strong>Journey Map</strong></td>
<td>A journey map catalogs the path of a user, object, or system in order to better understand it and look for design opportunities. By gaining empathy for a person or understanding of one’s process through an experience, considering the details of that process can illuminate areas for potential insights.</td>
</tr>
<tr>
<td><strong>Kaizen</strong></td>
<td>Kaizen is a Japanese word that translates to “continuous improvement.” It most often refers to an event during which employees rapidly improve a</td>
</tr>
</tbody>
</table>
INTRODUCTION TO CONTINUOUS IMPROVEMENT

<table>
<thead>
<tr>
<th>Process</th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kaizen</td>
<td>A method, set of tools, and mindset for improving work areas and processes by eliminating waste. Lean strives to create the <em>Ideal Process</em>. The ideal process is:</td>
<td>1. Specifications value from the customer standpoint. 2. Eliminates process steps that do not add value. 3. Achieves tight sequence between process steps so the product or service flows smoothly toward the customer (one-piece flow). 4. Allows customers to pull value from the process versus having the process pushed to them (e.g. customer can order their license online versus having to come to a physical location with limited service hours). 5. Follows PDSA until the <em>ideal</em> (no-waste) process is created.</td>
</tr>
<tr>
<td>Lean</td>
<td>Kaizen emphasizes the empowerment of all employees to suggest and implement process improvements.</td>
<td>course of one to five days. The facilitator leads a team in: 1. Mapping an existing process 2. Identifying the waste in the process 3. Brainstorming improvements 4. Mapping out a new, improved process 5. Developing an action plan to implement the new process</td>
</tr>
<tr>
<td>PDSA</td>
<td>The Lean methodology (Deming Cycle):</td>
<td>Applies a scientific approach to making improvements. The iterative process ensure learning is captured and improvements are continuous.</td>
</tr>
<tr>
<td>Poka-Yoke</td>
<td>Design error detection and prevention into production processes with the goal of achieving zero defects.</td>
<td>Eliminates errors through design, which saves resources in looking for and fixing errors later in the process.</td>
</tr>
<tr>
<td>Process Mapping</td>
<td>A technique to document the sequence and flow of steps in a process.</td>
<td>Helps you see how current work is done, and allows you to identify wastes and value added process steps.</td>
</tr>
<tr>
<td><strong>Process Measures</strong></td>
<td>Metrics that tell you how well you are doing and if operations are functioning properly.</td>
<td>Process measures make it possible to set goals, evaluate if strategies are achieving desired results, and communicate results.</td>
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<tr>
<td>----------------------</td>
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<tr>
<td><strong>Root Cause Analysis</strong></td>
<td>A problem solving approach that resolves the underlying causes of a problem, instead of applying quick fixes to visible symptoms. Some typical root cause analysis tools are the 5 Whys, fishbone diagram, and affinity and relations diagram.</td>
<td>Helps to ensure that a problem is eliminated by applying solutions or corrective measures to the “root cause” of the problem. A common approach is to ask why five times – each time moving a step closer to discovering the true underlying problem.</td>
</tr>
<tr>
<td><strong>SIPOC Diagram</strong></td>
<td>A tool used to identify high-level, relevant elements of a process improvement project. SIPOC is an acronym for: Suppliers, Inputs, Process, Outputs, and Customers.</td>
<td>It is a valuable tool for scoping a Kaizen event or a problem solving project.</td>
</tr>
<tr>
<td><strong>Six Sigma</strong></td>
<td>An approach for reducing process errors and variation using improvement experts, a structured method, performance measures, and tools. Six Sigma refers to a goal of 3.4 defects per million units produced.</td>
<td>Six Sigma is a great approach for complex improvement projects. Six Sigma follows the DMIAC method: Define, Measure, Analyze, Improve, Control</td>
</tr>
<tr>
<td><strong>Standard Work</strong></td>
<td>Documented procedures that capture current best practices (including the sequence and time to complete each task). Standardized work is living documentation of how the work should be done (it continually evolves through Kaizen).</td>
<td>Standardized work helps maintain service quality, provides a baseline for future improvement activities, and allows easier onboarding of staff.</td>
</tr>
<tr>
<td><strong>Visual Management</strong></td>
<td>Visual signals to communicate information needed to make business decisions. This mapping can identify wastes or areas requiring future analysis.</td>
<td>Visual management makes the state and condition of processes easily accessible and clear to everyone. The meters and gauges on a car dashboard are a common example.</td>
</tr>
<tr>
<td><strong>Voice of the Customer</strong></td>
<td>The needs, expectations, and service preferences of customers.</td>
<td>Helps in the design and delivery of products/services and assessing performance.</td>
</tr>
</tbody>
</table>
| **WorkOut** | A method for managers and teams to identify and prioritize opportunities for improvement. A WorkOut is typically completed in a half-day session led by a neutral facilitator. | During a WorkOut the team:  
1. Defines processes for delivering services  
2. Identifies process challenges and barriers  
3. Brainstorms solutions  
4. Sorts and prioritizes solutions |
For More Continuous Improvement Training, Resources, and Newsletter:

- CI Homepage: http://mn.gov/admin/government/continuous-improvement/
- Additional Resources: http://mn.gov/admin/continuous-improvement/resources/
- Additional Training Available: http://mn.gov/admin/continuous-improvement/skills-development/
- Sign-up for our CI 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. Sign-up 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!