Continuous Improvement: Process Improvement Measurement
Solving Problems That Change Lives

Agenda

• Welcome and introductions
• Process overview
• Why measure?
• What to measure?
• How to measure?
• Planning and documenting
• Tools and Resources
Learning Objectives

• Understand where measures fit in the improvement cycle
• Describe the importance of process measurement
• Understand how to use data to guide and sustain improvements
• Identify tools for collecting and displaying data to use for continuous improvement

The Reality: Where are we now?
• A series of steps or tasks to achieve an end or result.
• Processes have a beginning, an end and clearly identified inputs and outputs.
**Why measure? To...**

<table>
<thead>
<tr>
<th>UNDERSTAND the process</th>
<th>What are we doing? How long does it take?</th>
</tr>
</thead>
<tbody>
<tr>
<td>VERIFY assumptions</td>
<td>Does it work how we think it does?</td>
</tr>
<tr>
<td>IDENTIFY problems/waste AND innovations</td>
<td>This part takes too long! That area is doing this really well!</td>
</tr>
<tr>
<td>ASSESS if improvement occurred</td>
<td>Did we improve?</td>
</tr>
<tr>
<td>COMMUNICATE progress</td>
<td>Look, we improved!</td>
</tr>
<tr>
<td>MONITOR and sustain performance</td>
<td>How are we doing?</td>
</tr>
</tbody>
</table>

**What should we measure?**

You can’t manage – or improve – what you don’t measure!

*We measure what we want to manage and improve!*

*Lord Kelvin, and...*

*Bill Hewlett, Peter Drucker, W. Edwards Deming...*
Step 1

What do you want to measure or improve?

What do you do? Why?

Who is it for?

What do they want?

How will you know if they got it?

What do you do and why?

Why does this process exist? What is its purpose?

We do this...

Activity

...so that...

Immediate Output

...so that...

Intermediate Outcome

...so that...

Outcome

Measurement Difficulty Increases
What do you want to manage or improve?

What do your customers and stakeholders want and expect from the process?
What do they want to get from the process?
What do they want to know about the process?

AND

What are you working to *improve* about the process?

[Diagram showing the cycle: Did you improve? Are you meeting customer needs? Do you want to do better? Make improvements. Set improvement goals.]
Link to Results Based Accountability (RBA)

**Quantity**
- How much did we do?
  - Output measures
  - Process measures
  - Is your customer better off?

**Quality**
- How well did we do it?

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Example

**Quantity**
- How much did we do?
  - # of trainees
  - # of trainings

**Quality**
- How well did we do it?
  - % of trainees satisfied with training
  - % of trainees reporting taking action after training

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**Effort**
- How hard did we try?

**Effect**
- Is anyone better off?
  - % of agencies achieving performance goals
Plan – Do – Study – Act (PDSA)

Where to start

Where are we now?

Baseline data!
What Makes a Good Measure?

- Easy to Understand
- Important to the Customer
- Moves People to Act
- Is Strategic – Relates to Goals
- Is Robust and Meaningful
- Provides Quick Feedback

Data Sources

- Voice of the Customer
- Program Data
- Process Data
Voice of the Customer

Who are our customers?
What do they need and want?
Are we meeting their requirements?
How do you know if you are meeting customer requirements?

REMINDER: What do you want to manage or improve? Step 2

What do your customers and stakeholders want and expect from the process?
What do they want to get from the process?
What do they want to know about the process?

AND

What are you working to improve about the process?
CTQ trees deconstruct customer needs into measurable requirements

Customer: “I want good coffee.”

- Taste
  - Not acidic
  - Rich
- Temperature
  - Above 155°
  - Below 175°
- Cost
  - <$4.00

Process: Training staff

Customer Need: To learn CI methods and tools

Requirements:

Measurable Requirements:
Learn CI methods and tools

CTQ Tree for CI Training

Customer Need

Major Requirements

Measurable Requirements

Effective

90% of trainees report they learned something
90% of trainees report using what they learned

Convenient

100% of trainings in the metro or on site at trainee location
90% of trainings have <5 people on the waiting list

Efficient

90% of trainees report the training took the right amount of time

Exercise 1

Critical to Quality Tree
Example: Training staff

Percent Reporting Gaining New Knowledge or Skills (Lean 101 / Intro to CI)

Program Data

Input  Process  Output

Program
Historical data
Tends to be lagging
Important but has limits

Annual program measures showed training attendance dropping off in 2014, got customer feedback, decided to add additional courses to meet new training needs.
Program Data Example: Results

CI Training Attendance
- Kaizen Facilitation
- Lean 101
- New Courses

Fiscal Year

0 100 200 300 400 500 600 700 800 900 1000

Process Data

Input
- Information
- Customer requests

Process
- Staff
- Technology
- Time

Output
- Customers
Describes the efficiency and effectiveness of the process itself.

**Process Data – Types of Measures**

- **Cost**
  What is the cost per unit?

- **Cycle/Time**
  How long does the process take?

- **Complexity**
  How many steps or handoffs occur in the process?

- **Production**
  How many units are produced?

- **Quality**
  What is the error rate?
  What is the customer satisfaction rate?

- **Value**
  What is the percent of value-added time or steps in the process?
Potential sources of data about your process:

- Process Maps
- Financial Reports
- Time or Observational Studies
- Data Base/System Reports
- Audits/Quality Assurance Data
- Voice of the Customer
- Check Sheets

Example: Swim Lane Map
## Worksite Inspection Process

<table>
<thead>
<tr>
<th></th>
<th>Current Qty</th>
<th>Current Time</th>
<th>Future Qty</th>
<th>Future Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tasks</td>
<td>85</td>
<td>16 hrs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Waits</td>
<td>22</td>
<td>57 days</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Handoffs</td>
<td>35</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decisions</td>
<td>12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>File/stores</td>
<td>32</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total time</td>
<td></td>
<td></td>
<td></td>
<td>59 days</td>
</tr>
</tbody>
</table>

### Example: Check Sheet

#### Inspection Delays – Champlain, April 2014

<table>
<thead>
<tr>
<th>Reasons</th>
<th>Number</th>
<th>Total</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact absent</td>
<td>/////////// //</td>
<td>8</td>
<td>27%</td>
</tr>
<tr>
<td>Contact busy</td>
<td>////////// /// /// ///</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wrong address</td>
<td>//</td>
<td>2</td>
<td>7%</td>
</tr>
<tr>
<td>Vehicle problems</td>
<td>//////////</td>
<td>4</td>
<td>13%</td>
</tr>
<tr>
<td>Weather issues</td>
<td>/</td>
<td>1</td>
<td>3%</td>
</tr>
<tr>
<td>Business closed</td>
<td>//////////</td>
<td>2</td>
<td>7%</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>30</td>
<td></td>
</tr>
</tbody>
</table>
Example: Data for CI Training

**Quality Measure:**
Overall rating of training by trainees in post-training surveys

**Production Measure:**
Number of trainees per month

**Cost Measure:**
Staff hours per training

Example: Flu Specimen Testing

**Time Measure:**
Percent of specimens that take > 6 days to verify

**Quality Measure:**
Testing errors

**Process Complexity Measure:**
Number of handoffs
What Makes a Good Measure?

- Easy to Understand
- Important to the Customer
- Moves People to Act
- Is Strategic – Relates to Goals
- Is Robust and Meaningful
- Provides Quick Feedback

Exercise 2

Understanding Process Performance
A document that defines all the data collection details, including how much and what type of data collection is required and when and how it should be collected.

<table>
<thead>
<tr>
<th>Performance Measure</th>
<th>Operational Definition</th>
<th>Data Source &amp; Location</th>
<th>Sample Size</th>
<th>Who Will Collect The Data</th>
<th>When Will Data Be Collected</th>
<th>How Will Data Be Collected</th>
<th>Other Data Not Shown In Collected if Same 1980</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course is developed within 10% of industry standard.</td>
<td>In-house training and no more than 20% of course time in SIT.</td>
<td>Project Plans</td>
<td>17 (100%) of workers with 1083</td>
<td>Facilitator</td>
<td>01/ – 02/</td>
<td>Participant will be certified from project plan data</td>
<td>Less than 10% of school or district is associated with network</td>
</tr>
<tr>
<td>Less than 10% of development time is associated with network.</td>
<td>No more than 30 hours/week for 6 hours per week. No more than 12 hours/week for 6 hours per week.</td>
<td>Project Plans</td>
<td>17 (100%) of workers with 1083</td>
<td>Facilitator</td>
<td>01/ – 02/</td>
<td>Participant will be certified from project plan data</td>
<td>NA</td>
</tr>
</tbody>
</table>
### Attributes for Data Collection Plan

<table>
<thead>
<tr>
<th>Title</th>
<th>Clear, easy to understand, applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Operational Definition</strong></td>
<td>Scope of the measure. What are we talking about?</td>
</tr>
<tr>
<td><strong>Purpose</strong></td>
<td>Why are we monitoring this? Does it relate to the problem/issue?</td>
</tr>
<tr>
<td><strong>Target</strong> (or when do we expect the curve to turn?)</td>
<td>Do we have mandates/standards we are not meeting? What is our goal?</td>
</tr>
<tr>
<td><strong>Formula/Calculation</strong></td>
<td>Is there a formula/calculation for this measure?</td>
</tr>
<tr>
<td><strong>Frequency</strong></td>
<td>How frequently will the data be collected?</td>
</tr>
<tr>
<td><strong>Source</strong></td>
<td>Where will the data come from? How will it be collected?</td>
</tr>
<tr>
<td><strong>Responsibility</strong></td>
<td>Who will be responsible for collecting the data? Analyzing? Reporting? Communicating?</td>
</tr>
</tbody>
</table>

### Example: CI Training – Trainees use what they learned

<table>
<thead>
<tr>
<th>Title</th>
<th>Trainees use what they learned</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Operational Definition</strong></td>
<td>Six months after CI training, trainees report using what they learned at least once</td>
</tr>
<tr>
<td><strong>Purpose</strong></td>
<td>Ensure that trainees are using what they learned, report on this</td>
</tr>
<tr>
<td><strong>Target</strong></td>
<td>90%+ of trainees should be using what they learned</td>
</tr>
<tr>
<td><strong>Formula/Calculation</strong></td>
<td>Percent of respondents to 6-month post-training surveys who report using what they learned at least once</td>
</tr>
<tr>
<td><strong>Frequency</strong></td>
<td>Monthly surveys of trainees 6 months prior</td>
</tr>
<tr>
<td><strong>Source</strong></td>
<td>6 month post-training survey</td>
</tr>
<tr>
<td><strong>Responsibility</strong></td>
<td>Cathy Beil will collect and summarize the data. Cathy will report on the data to the CI team.</td>
</tr>
</tbody>
</table>
Data Collection Plan Exercise

- Use your data collection plan. Be intentional.
- Post Charts on the Wall
- Have check-ins! How is it going?

Monitor and Sustain Work
Use the visualization that makes the most sense for your data and audience!

- Box & Whisker Plot
- Check Sheet
- Control Chart
- Histogram
- Pareto Chart
- Run Chart
- Scatter Plot (Scatter Diagram)
Displaying Measures - Guidelines

• Simplify, simplify, simplify
• Consider when charts or tables are more appropriate
• Include a title and label both the x and y axis
• Do not use 3D
• Use the right chart for the right message
• Charts should be self-explanatory – test them!

Tips for Successful Measurement

• Be intentional about selecting measures.
• Measures should focus on the process, not people
• Engage process owners
Tips for Successful Measurement

• Share data with the group
• Define the measure
• Analyze and use the data

Understand your process

▪ What does the process look like?
▪ What are the steps?
▪ How long is it taking?
▪ Where is the waste?
▪ What are my customer requirements?
Use data throughout the PDSA cycle

• Collect baseline data on your process.
• Use data to make, assess, & sustain improvements.

Resources

MDH Office of Performance Improvement (OPI):
QI Toolbox -
http://www.health.state.mn.us/divs/opi/qi/

American Society for Quality (ASQ):
Tools
http://asq.org/knowledge-center/index.html

MN Office of Continuous Improvement:
http://mn.gov/ci

State of Maine – Department of Health & Human Services