About Operational Strategic Initiatives

Mission
To continuously advance the framework for UC San Diego’s sustainable excellence by identifying opportunities and providing solutions that improve overall service, dedication to people, and financial stewardship.
Chancellor Support, Scholarships, OSI, Measurements

Projects
Projects
Projects

Continuous Improvement
Project Management
Change Management
Data Analysis

Ideation Program, Trainings, Communities of Practice
What is Lean Six Sigma?

Lean Six Sigma: Lean strengthens Six Sigma: Problem solving + improving processes delivers greater results.

Lean focuses on waste reduction by streamlining a process.

Six Sigma focuses on preventing defects through problem solving.

Speed

Accuracy

Results
LSS Belt Levels

- Black Belt
- Green Belt
- Yellow Belt

White Belts:
1. Basic LSS Terminology
2. How to identify Process Issues
3. LSS Concepts
LSS Belt Levels

- Black Belt
- Green Belt
- **Yellow Belt**
- White Belt

Yellow Belts:
1. Basic LSS Tools Application
2. How to identify root cause
3. How to select improvements
LSS Belt Levels

- **Black Belt**
- **Green Belt**
  - Yellow Belt
  - White Belt

Green and Black Belts:
1. Project-based application
2. How to measure effectiveness of changes
3. How to leverage tools effectively
Basic LSS Concepts

Everything we do is a process with a supplier and customer.

All processes have variation and waste – no process is perfect.

All variation and waste has a cause.

Known causes can be eliminated, reduced or controlled.
Pursuit of Perfection

To achieve Six Sigma, a process must fit within the customer specification limits 99.9997% of the time (i.e., only 3.4 out of 1 million instances are considered defects).
Problem Solving
DMAIC Model
Define: Project Charter

- Business Case
  - Why is it important for the business to complete this project?
  - What is the financial impact?
- Scope
  - What’s in?
  - What’s out?
- Team Members
- Resources accessible to the team
- Schedule
Define: Voice of the Customer (VOC)

<table>
<thead>
<tr>
<th>Customer Comment</th>
<th>Customer CTQ</th>
<th>Customer Definition of Defect</th>
<th>Metric</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is being said?</td>
<td>What is important to customer?</td>
<td>What is not acceptable for the customer?</td>
<td>How will you measure outcomes? (time / pass-fail / temperature / etc.)</td>
</tr>
<tr>
<td>Is there only one cook back there or what!?</td>
<td>Food prep time</td>
<td>Food takes too long to prepare</td>
<td>45 seconds or less</td>
</tr>
</tbody>
</table>

VOC activities translate what customers say they want into customer requirements: i.e., what customers find “critical to quality” (CTQ) and what they define as a “defect.” Defects can then be measured.

Continuous OR Discrete data?
Gemba Walk

- Gemba means “the real place” in Japanese
- Learn through observation and engagement: go to the source(s) to experience a process firsthand
- Test your assumptions about a process against reality
  - Go see, ask why, show respect
  - Focus on the process, not evaluating the people performing the process steps
Critical Path

Problem: How to make a complex process map into a linear Value Stream Map?

...the most common path

...the most costly path

...the longest path
Measure: Value Stream Mapping

- Follow a product or service’s production path from beginning to end.
- Draw a visual representation of every process step in the current material and information flows.
Analyze: Value Add Defined

**Value Added to Customer**: Process steps that matter to customers

**Value Added to the Business**: Process work that does not create value from the standpoint of the customer

**Waste**: Steps that create no value and can be eliminated

**Value add requirements:**
- The activity physically changes the product (or adds important information).
- The activity must be done right the first time (i.e., it should not be rework).
- Customers must be willing to pay for it.
8 Wastes:  **DOWNTIME**

- **Defects**: Efforts caused by rework, scrap, and incorrect information.
- **Overproduction**: Production that is more than needed or before it is needed.
- **Waiting**: Wasted time waiting for the next step in a process.
- **Non-Utilized Talent**: Underutilizing people's talents, skills, & knowledge.
- **Transportation**: Unnecessary movements of products & materials.
- **Inventory**: Excess products and materials not being processed.
- **Motion**: Unnecessary movements by people (e.g., walking).
- **Extra-Processing**: More work or higher quality than is required by the customer.
Analyze: Cause-and-Effect Diagram

A cause-and-effect diagram shows possible relationships between potential causes in order to identify likely “root” causes.

- Can also be called a “Ishikawa” diagram or a “Fishbone” diagram
- Major causes and root causes make up the bones of the fish and are grouped into categories
- Use the ‘5 Whys’ technique to get to the root cause

![Cause-and-Effect Diagram]

- Problem
  - Mother Nature
  - Process
  - People
  - Materials
  - Machine
  - Measurement
Analyze: 5 whys

- Monument floors are crumbling - Why?
- Harsh chemicals and power washing needed often - Why?
- Lots of bird droppings - Why?
- Many more tasty spiders around - Why?
- Lots of yummy gnats around - Why?
- Gnats are attracted to the lighting - Why?
- Gnat biology - Why?
Frequency Plot / Histogram

- A picture of the variation in a process
- Reveals patterns that provide clues to certain types of problems
- Rough check if data are distributed normally
Run Charts and Examples of Signals

**Run Chart:** Reveals trends over time and forms the basis for Control Charts that check statistical significance of process variation.

- **Trend:**
  6 or more points in a row increasing or decreasing

- **Process Shift:**
  8 or more points in a row above or below the mean

- **Bias or Sampling Problem:**
  14 or more points in a row alternating up and down ("saw tooth")
To achieve Six Sigma, a process must fit within the customer specification limits 99.9997% of the time (i.e., only 3.4 out of 1 million instances are considered defects).
**Process Sigma Definition**

- Process Sigma (or σ) is a statistical concept that represents how much variation there is in a process relative to customer specifications.
- The Process Sigma value is based on defects per million opportunities.
- “Six Sigma” is defined as 3.4 Defects Per Million Opportunities.

<table>
<thead>
<tr>
<th>Lots of variation</th>
<th>Hard to produce output with customer requirements (specifications)</th>
<th>Low sigma values (0–2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderate variation</td>
<td>Most output meets customer requirements</td>
<td>Middle sigma values (3–5)</td>
</tr>
<tr>
<td>Very little variation</td>
<td>Virtually all output meets customer requirements</td>
<td>High sigma values (6)</td>
</tr>
</tbody>
</table>

[Diagram of normal distribution with sigma levels labeled]
Kaizen Format

Measure Current Process
- Objective analysis of current state
- Value Stream Map
- Data Driven

Prioritize Solutions
- Identify biggest opportunities to make improvements
- Identify root causes

Develop Action Plan
- Assign owners and deadlines
- Progress Updates
Control and Reaction Plan

1. What needs to be measured?
2. What safeguards should be built in to avoid errors?
3. What standard operating procedures need to be developed?
4. Who, how, and when will we assess our new process?
Controls: Mistake Proofing
<table>
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<tr>
<th>Applications</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Travel Requests</strong></td>
<td>Student employee travel requests returned fewer errors and reduced overall time by 7 days.</td>
</tr>
<tr>
<td><strong>Capacity</strong></td>
<td>Reduce resolution time for ITS systems downtime activity, resulting in more productivity, less rework, greater compliance, and an annual savings of $250K ($285K to ~$3K).</td>
</tr>
<tr>
<td><strong>Safety</strong></td>
<td>Reduce number of knife cuts in Housing Facilities by 50%</td>
</tr>
<tr>
<td><strong>Inventory and waste</strong></td>
<td>Create and implement process for tracking, measuring, and billing for oncology drug waste in IV rooms. Results in approx. $1.6M annual revenue recovery</td>
</tr>
<tr>
<td><strong>Quality</strong></td>
<td>Improve UCSD Alumni Association Workzone tool to increase user satisfaction survey score from 4 to 8.5 points</td>
</tr>
<tr>
<td><strong>Billing</strong></td>
<td>Reduce delivery time for ARUP lab paperwork to reach billing department from 5-10 days to &lt;5 days.</td>
</tr>
<tr>
<td><strong>Recruitment</strong></td>
<td>From the time a candidate is identified to the moment they received an official offer letter, the cycle time was reduced from 5.5 months to 3.6 months.</td>
</tr>
<tr>
<td><strong>Onboarding</strong></td>
<td>Improve ITS onboarding process to eliminate unnecessary steps to increase completion rate of onboarding form from 48% to 100%</td>
</tr>
</tbody>
</table>
Key Takeaways

- LSS empowers employees at all levels to be change agents
- Formal training provides a common language and tools
- LSS emphasizes collaboration between departments, and can address institutional silos
- Change initiatives are more successful when true root cause is addressed, and when all levels of staff are driving the change

Next Steps

- What is your 15%?
- Where do you have discretion and freedom to act?
- What can you do without more resources or authority?
Thank you!

For more info regarding upcoming Lean Six Sigma training and events, visit: osi.ucsd.edu

Or email us at: OSI@ucsd.edu
Questions?