Case Study:
Critical Success Factors – Lean Six Sigma Deployment

The Performance Conference 2008
October 21, 2008

Overview

• Sonoco Overview
• Lean Process
• E-Learning
• Project Phase Gate
• Lean Management Execution Model
• Results
• Key Success Factors
Sonoco Overview

Sonoco: 100+ Years of Packaging

- Sonoco = Southern Novelty Company
- Founded in Hartsville, South Carolina in 1899
- First product cone-shaped paper yarn carrier used for winding and transporting yarn
- Today, Sonoco is a $4.1B global manufacturer of industrial and consumer packaging products
- > 300 operations in 35 countries
- 17,700 employees
Sonoco’s Customers

- Abbott Laboratories
- ConAgra Foods
- Kraft
- Nabisco
- P&G
- Nestle
- Masterfoods USA
- General Mills
- MeadJohnson
- International Paper
- Unilever
- Georgia-Pacific
- Whirlpool

Sonoco is Global Packaging

- Founded in 1899
- More than 324 operations
- 35 countries/5 continents
- 17,700 employees
- 2006 Sales: $3.7 billion (est)

Countries with Sonoco operations
Sonoco: 100+ Years of Innovation

- Sonoco moved to 550 on the 2007 Fortune 1000 list of publicly traded companies. (up from 563 in 2006 - 10.5% sales growth)
- Named one of the Top 20 U.S. Companies for Leaders by Hewitt Associates
- KLD Indexes: Named for 13th consecutive year to Domini 400 SocialSM Index, consisting of 400 U.S. companies that demonstrate leadership in corporate social responsibility.
- Honored as one of the Top Ten Corporate Citizens in Environmental Stewardship by Citizen's Advisers
- Selected as one of the 100 Best Corporate Citizens by the Business Ethics Magazine
- CRO (Corporate Responsibility Officer) magazine named Sonoco one of the “10 Best Corporate Citizens” in the paper packaging industry in 2007
- Annual report expert Sid Cato named the Sonoco 2007 Annual Report number 15 on his 21 Very Best List

Corporate Recognition
Sonoco Business Segments

**Consumer Packaging**
- Global Composite Cans
- Plastic Containers
- Flexible Packaging
- Metal & Plastic Closures

**Tubes and Cores/Paper**
- Global Engineered Carriers
- Global Paper
- Protective Packaging
- Molded Plastics

**Other**

**Services**
- Service Centers
- Graphics Management
- P-O-P Displays

Sonoco is a Leader in Recycling

- Sonoco has been reclaiming and recycling packaging materials for nearly a century
- Committed to helping its customers reduce disposal cost and meet recycling goals
- Goal is to close the packaging loop when possible and use recycled material to produce a functional package
- Sonoco’s global reclamation annually collects three million tons of recovered paper and packaging
- Recycled materials used in virtually all paper and plastic products and steel ends
- FDA confirms Sonoco’s recycled use contents are the highest values in the food industry
Sonoco Sustainability Solutions

Sonoco Sustainability Solutions has been created to help customers create and implement sustainable business solutions by:

• Identifying cost avoidance opportunities through reducing and diverting materials currently going to landfills
• Converting waste streams to revenue streams by finding alternative uses for the materials
• Providing summary reporting of both productivity improvements and sustainability statistics

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Sonoco’s Lean Process

Sonoco’s Six Sigma & Lean Timeline
1997-2006

874 Trainees
580 Global Leaders
$16,500,000 Investment
The Case for Change

- Key driver for change:
  - Six sigma & lean project yield = 30%; world class = 85%+
- Lean and six sigma deployed independently with no synergy
  - Using incorrect tools to solve problems, based on class attended
- VOC: Cycle time for six sigma too long (9 months - >1 year)
- Tool use beyond simple problem solving tools minimal
- Too few skilled mentors to usher projects through
- No phase gate process for Lean projects
- Lack of change management
- Businesses are not sustaining gains → processes and controls slip back to status quo

The Lean Sigma Process

![The Lean Sigma Process Diagram](image-url)
The Lean Sigma Process

Define

Analyze

Improve

Measure

Control

Measure

Define

6-Sigma Reduce Variation

Define
**Blended Learning Solutions**  
**Funnel approach**

All projects start with basic problem-solving tools delivered via e-Learning.

- **Cycle time, throughput, changeover, line balancing, inventory projects = lean tools**  
  Case studies/simulations & c-Learning

- **Variation reduction using ANOVA, other statistical tools**  
  c-Learning & instructor-led web conferencing

- **Highly complex analysis, multiple factor DOEs, etc.**  
  One-on-one mentoring with MBB
e-Learning and Change Management

Sonoco’s e-Learning Modules

Progress is tracked
E-learning Screenshot

In-line Questions
Interactive In-line Question

Benefits of e-Learning

- Gain proficiency with process improvement tools through access to knowledge and resources necessary to complete projects
- Course can be accessed anytime 24/7
- Navigate through the modules in any order, as many times as desired
- Ongoing reference resource
- Travel cost savings
Ushering Projects Through Phase Gate Approach

• **Project Ideation Phase**
  – Who: Anyone can provide project ideas. Division or staff Productivity Champion + Productivity Steering Team populate the funnel using the project priority tool to select top projects for the…

• **Feasibility Phase**
  – Who: Productivity Champion + steering committee utilize risk and return tool to select projects to move to the…

• **Define Phase**
  – Who: Productivity Champion works with Designated project sponsor to scope & charter the project. Project charter is vetted with Corporate OE and passed through to the…

• **Measure Phase**
  – Who: Project Leader executes measure deliverables and weekly mentoring sessions are held through the Measure Phase.
  – Measure Gate meeting held with Project Sponsor, Project Mentor and Project Leader. Project is approved to go to the…
Ushering Projects Through Phase Gate Approach

• **Analyze Phase**
  - Project Leader executes on Analyze Phase deliverables and attends weekly mentoring sessions.
  - Analyze Gate meeting held with Project Sponsor, Mentor, and Leader. Project is passed through to the…

• **Improve Phase**
  - Project Leader executes on Improve Phase deliverables and attends weekly mentoring sessions.
  - Improve Gate meeting held with Project Sponsor, Mentor, and Leader. Project is passed through to the…

• **Control Phase**
  - Project Leader executes on Control Phase deliverables and attends weekly mentoring sessions.
  - Control Gate meeting held with Project Sponsor, Mentor, Leader and member of Corporate OE. Project is assessed for leveragability and approved for presentation to either division or staff leadership or Corporate Leadership Team.

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**Integrated DMAIC and Change Management Process**

Source: LaMarsh & Associates
Lean Management System

Management drives behaviors to support the Lean Sigma Management System.

Standard work is built from the team up (i.e. leader standard work supports the standard work at the next level in the organization).

Accountability
Lean Sigma Management System

Mentor/Teacher/Sensei
Responsible for results

Mentee/Apprentice
Responsible for execution

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**Lean Sigma Management System Execution Model**

**Daily**
- Measure Inputs
  - Leader Standard Work
    - Daily GEMBA Walks
    - Control Board Monitoring
    - SPC updates
    - Common vs. Special Cause
    - Quality Checks
    - Maintenance Checks
    - 6s / Safety Checks
    - Standard work checks

**Perform**
- Yes

**Perfect / On Target?**
- Yes

**Prepare Inputs**
- Manpower (Mind-set / Skills/Training)
- Materials & Information
- Machines & Tools
- Methods (standard work)
- Measures to monitor above

**Execute Standard Work Using Visual Controls:**
- Go and See Performance to Standard. **Perfect** means assessing whether the process performed as planned and the process output is on target. If the process output is not on target, coach the standard work.
- Data is recorded regularly and is highly visible.
- Enables leaders to quickly spot problems and move into action.
- **Perform** implies the process steps are well defined, standardized, mistake-proofed, and understood for consistent and effective execution.

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**Response Plan**
- GEMBA Walk (coaching/ teaching the Std. Work)
- Kaizen/Projects
- DMAIC
- Root Cause

**Daily/Weekly/Monthly Accountability:**
Sets direction and pace + controls resources assigned to improvement activity.
**Respond to out of control conditions:** Supervisors, Team Leaders and Workers reduce special cause variation through response plans.
- Monitor output trends for funnel projects
- Reduce common cause variation through projects or kaizen corrective action

**Daily/Weekly/Monthly**
- Progress / Review Trends
  - Progress Reviews
    - Safety
    - Quality
    - Cost
    - Delivery
  - Funnel Projects/Kaizen development
Results to Date

Project yield: 37%, based on 2-year rolling average
YTD yield: 60%
Project cycle time average: 5.1 months
E-learning trained associates: > 300
On track to deliver $100MM+ in productivity
Keys to Success

- Continuous Leadership Involvement
- Lean Leadership Council
- Simulations
- Visual Performance Communication
- Celebrate Success: No matter how small
- Kaizen Structure
- Train Participants - Kaizen Facilitator training
- Mentoring
- Control Plans
Leadership Involvement

• Critical to Success
• Standard Work for Leaders
  – Control Plan Review
• Demonstrates Importance of Work
• Opportunity for Communication
• Re-emphasize Corporate Goals

Lean Leadership Council

• Cross Functional Management Team
• Meets Monthly (more frequently at beginning)
• Manages Funnel
• Ensures Projects are planned and resourced
• “Build In” Structure and Execution to projects
Macro Case Study/Simulation

- Participants run the current state process, observe improvement opportunities and design and run future state
- Tools used and demonstrated are: VSM, takt time, SIPOC, Pareto charts, cycle time, kanban, one-piece flow, control charts, MSA, control plans

Simulation in Action
Performance Communication

- Communication Plan
  - Employee driven
- Daily Management System
- Plant Scoreboards
- Quarterly Performance meetings
- Manager Interaction
- Leadership Team “Floor Time”
- Discuss performance in relation to “Story”

Effective Recognition

- Sincere
- Fair
- Consistent
- Timely
- Frequent
- Flexible
- Appropriate
- Specific
Recognition vs Reward

**Recognition**
- Non-cash
- Frequent
- Psychological
- Personal – sincere
- Value-Principle based
- Engages employees
- Encourages behaviors

**Reward**
- Cash
- Infrequent
- Financial
- Impersonal – from bank
- Based on Budget
- Attract employees
- Short Term focus

“1001 Ways to Reward Employees” – Bob Nelson

Certificates of Recognition

Adanna Ohaegbulam
Has successfully participated in a Continuous Improvement Event:

**Waste Elimination Loss Tracking**
This 6th day of August, 2004

Jill Bolich
Waste Elimination Champion

Jeff Slater
Waste Elimination Facilitator
Kaizen Event Guidelines

- Preparation Required:
  - Identify the opportunity
  - Create an event charter
  - Determine deliverables (measures to be improved)

- Resources Required:
  - 7 people +/- 2
  - Leadership commitment
  - Empowerment to make permanent changes

- Time: 5 days (some flexibility)
  - ½ day for training & awareness
  - 1 day for TO-BE map
  - 3.5 days for AS-IS map and benefits realization
    - Make changes during the week

- Kaizen Facilitator Training (Participate, Co-Lead, Lead)

Kaizen Participant Training

- Tell them what “Lean” is (and isn’t)
- Surprise them with a US company that is successful at Lean that they know about (Danaher)
- Demonstrate where it has helped your organization
- WIIFM – What’s in it for me?
  - Longevity of business
  - Career opportunity
  - Learning
- The new cost model (Market Price – Cost = Profit)
  - Global economy
  - Long gone are days of “checking your head” at the door
- Voice of the Customer –
  - Realize everyone touches the customer
  - Who is your customer?
Implementation Success Factors

Good Control Plans…

• Document Standard Work
• Training
• Audit Standard Work (work process review)
• Assign Accountability for: measures, reviews, audits
• Measures
• Regular Metric Reviews
• Response Plans: When your takt goes out of whack… How do you act?

Kaizen Facilitator Training

• Waste Elimination
• What is Kaizen?
• Preparing for a Kaizen Event
• Running the Kaizen Event
• Leading Teams in a Kaizen Event
  – Tips and techniques
  – Facilitation practice
• Kaizen Event Post-Work
• Standard Event Presentation
• Facilitation Basics
• Criteria for Certification (Participate, Co-Lead, Lead)
• Where to Go For Help
Training Question:

Only 8% of material taught in a classroom setting is retained by students when they leave the classroom. How do we ensure that our productivity improvement practitioners have a working knowledge of the other 92%?

Source: isixsigma.com

Answer: Effective Mentoring

Description of an effective mentor:

- **Business Knowledge 35%**
  - Business strategy and objectives, customer requirements, core and enabling processes, etc.

- **Change Leadership Ability 35%**
  - Experience in facilitating change, active listening skills, influencing, and verbal communications skills

- **Process Improvement Know-How 30%**
  - Thinking in cause-and effect relationships, root cause, data-based decision-making, ability to think cross-functionally
Benefits of Effective Mentoring

• Aids in solidifying and reinforcing knowledge transfer
• Helps reduce project cycle time
• Provides cross-functional information sharing
• Many problems have been encountered before and connections to previous work can be made
• Helps build collaboration among those receiving the mentoring

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Questions

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Recommended Reading

- Toyota Production System – Ohno
- Lean Solutions, Lean Thinking – Womack & Jones
- The Toyota Way – Jeffrey Liker
- Office Kaizen – William Lareau
- Kaizen – Masaaki Imai
- The Goal – Eli Goldratt
- Learning To See – Rother & Shook
- Today and Tomorrow – Ford
- Rebirth of American Industry – W. Waddell & N. Bodek
- Creating a Lean Culture – David Mann
- 20 Keys©, Leadership Wastes – Kaufman Global
- Lean Solutions, Lean Thinking – Jim Womack
- Total Productive Maintenance© – Productivity Inc
- Rebirth of American Industry – W.H. Waddell & N. Bodek
- 2 & 4 hour house – www.2hourhouse.com

Changing the way the World Sees Packaging