Driving Customer Satisfaction with Lean Six Sigma

Bob Brooks
Genesis Group
What is Six Sigma?
What is Lean?
The Two Sides of Six Sigma

Six Sigma

Measure

Philosophy
The Six Sigma Stairway

Customer Requirements

Measurement

Employee Participation/Empowerment

Exploiting Technologies

Supplier Partnerships

Total Cycle Time Reduction

Defect Elimination

Customer Survey

Baseline

Entitlement

Benchmark

0 1 2 3 4 5 6 7

100,000
10,000
1,000
100
10
0
Strategy and Process

Strategy

enables

Processes

drives
The Process Perspective is:

• A disciplined method and approach to focus on business processes.
• A horizontal view of the business.
• A means of improving customer satisfaction
Customers Drive Process

Input
- Defects
- Timeliness
- Cost

Process
for each step:
- Defects
- Cycle Time
- Costs

Output
- Defects
- Timeliness
- Cost

Act

Measure

Customer Satisfaction
- 5-Ups
“I don’t know what ‘platform support’ is, but let me answer your question very simply. If there is a key customer requirement, do it. Whatever this thing is - ‘platform whatever’ - get it out of the way.”

Lou Gerstner
Six Sigma as a Measure

- 3 Sigma Process
- 6 Sigma Process
- 3 Sigma Process

Lower Specification Limit

Upper Specification Limit

X
Sigma as a Measurement of Defects

IRS Tax Advice (Phone In)

- Average Company
- Best in Class

- Poor

- (66,810 DPMO)
- (233 DPMO)
- (.43 DPMO)

Domestic Airline Flight Fatality Rate

Restaurant Bills
- Doctor Prescription Writing
- Payroll Processing
- Order Write-up
- Journal Vouchers
- Wire Transfers
- Airline Baggage Handling

(233 DPMO)
Six Sigma Improvement Model

The DMAIC” PROCESS

- **Define** – Scope the problem
- **Measure** – Gather Data
- **Analyze** – Root Cause Data Analysis
- **Improve** – Develop Solutions
- **Control** – Maintain the Gain
Six sigma provides a systematic, logical approach to project management.

<table>
<thead>
<tr>
<th>Define</th>
<th>Measure</th>
<th>Analyze</th>
<th>Improve</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Charter</td>
<td>-ID key measures</td>
<td>-Analyze data &amp; process</td>
<td>-Develop solutions</td>
<td>-Document plan</td>
</tr>
<tr>
<td>ID 5-Ups</td>
<td>-Collect baseline data</td>
<td>-Use graphical &amp; statistics to verify root</td>
<td>-Select best solution</td>
<td>-Response plan</td>
</tr>
<tr>
<td>Stakeholders</td>
<td>-Validate scope</td>
<td>cause(s)</td>
<td>-Pilot &amp; Measure</td>
<td>-Control Charts</td>
</tr>
<tr>
<td>Map the</td>
<td></td>
<td></td>
<td>-Implement full scale</td>
<td>-Institutionalize</td>
</tr>
<tr>
<td>process</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Copyright 2002 Consensus Strategies, LLC. All Rights Reserved.
Six Sigma Steps and Tools

- Define
  - Planning matrices
  - Fishbone
  - Pareto chart
  - Histogram
  - Run chart
  - Scatter diagram
  - Process capability measures
  - Sampling plan
  - Operational definition
  - Data collection plan
  - Defect concentration diagram
  - Check sheet
  - Traveler sheets

- Measure
  - Qualitative analysis
  - Graphical analysis
  - Data stratification
  - Estimation
  - Hypothesis testing
  - Analysis of variance
  - Regression analysis
  - Data transformations
  - Multi-vari charts
  - Box plots
  - Cost/benefit analysis

- Analyze
  - Process mapping
  - Decision matrices
  - Pugh’s method
  - Requirements analysis
  - How-how fishbones
  - FMEA
  - Error-proofing
  - Cellular design
  - Single piece flow systems
  - Pull systems
  - Process balancing
  - Process piloting
  - Force field analysis
  - Gantt charts

- Improve
  - Statistical process control
  - Corrective action planning
  - Documented Procedures
  - Training

- Control

- Define
- Measure
- Analyze
- Improve
- Control

Copyright 2002 Consensus Strategies, LLC.
What is Lean?

• A process improvement methodology
• Based on principles developed at Toyota in the 50’s
• Focuses on reducing cycle time by:
  • Reducing the seven wastes
  • Using the “lean toolbox”
Six Sigma and Lean –

How They’re Similar

• Both methodologies:
  • Emphasize focusing on the customer
  • Involve empowering employees
  • Stress continuous improvement
  • Use basic “quality tools”
How They’re Different

Six Sigma:
• Focuses on defect reduction
• Emphasizes analysis
• Is process focused—Relies heavily on statistics
• Emphasizes implementation infrastructure
• Is more client-centric

Lean:
• Focuses on cycle time reduction
• Emphasizes solutions
• Is value stream focused
• Is more consultant driven
• Tends to be implemented in phases by tool
Lean Concepts

- Pull Systems
- Single Piece Flow
- Continuous Improvement
- Muda
- Value Stream
The Seven Wastes

- Over-production
- Waiting
- Moving objects
- Moving people
- Inventory
- Over-processing

Defects
- Production
- Inspection
- Repair

Womack and Jones, Lean Thinking
Value - Add Activities

• Does the customer care?
• Does it change the thing?
• Is it done right the first time?
• Is it required by law or regulation

The answer to all 4 questions must be yes for a step to be value-add.
## Common Lean Tools

### Value Stream Mapping

<table>
<thead>
<tr>
<th>Process Step</th>
<th>Estimated Avg</th>
<th>Value Added</th>
<th>Rework</th>
<th>Waiting</th>
<th>Control</th>
<th>Move</th>
<th>Setup</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Collect Pieces</td>
<td>20 seconds</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Pick up wall</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>3 Pick up roof</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>4 Seams Good?</td>
<td>10</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 Get new</td>
<td>5</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 Cut tape</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 Tape Front</td>
<td>11</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 Tape Back</td>
<td>12</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9 Pick up slab</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 Tape slab to wall</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>86</strong></td>
<td><strong>32</strong></td>
<td><strong>5</strong></td>
<td><strong>0</strong></td>
<td><strong>10</strong></td>
<td><strong>15</strong></td>
<td><strong>24</strong></td>
</tr>
</tbody>
</table>

### 5Ss

- **Seiri** (Organization)
- **Seiton** (Orderliness)
- **Seiso** (Cleanliness)
- **Seiketsu** (Standardized cleanup)
- **Shitsuke** (Discipline)

### Visual Controls

- **Kan-Ban**
  - Standard Work
  - Poka-Yoke
  - SMED
  - Kaizen Events
Lean Tools Support Six Sigma

Lean Tools
- Value stream analysis
- The seven wastes
- The five S’s
- Cellular design
- One piece flow
- Pull systems
- Error proofing
- Visual controls
Removing Non-Value Add Steps
Also Reduces Defects
Do It Right The First Time $10
Fix It Before It Gets Out $100
Fix It After It Comes Back $1000

What happens to revenue as defects are reduced?
Six Sigma Profit Model

- Effective Processes
- Satisfied Customers
- Profitability
What is the pay-off?
Higher Quality Leads to Higher Profits

On average, companies that deliver superior quality to customers, relative to companies that offer inferior quality, achieve much greater return on investments (ROI).

Source: Quality Progress, April 1999.
Quality Award Winners Out-Perform Competition

Average percentage of change in performance

- Award winners
- Control firms

Performance measure

- Operating income
- Sales
- Total assets
- Employees
- Return on sales
- Return on assets

Average percentage of change in performance

- Small firms
- Large firms

Performance measure

- Operating income
- Sales
- Total assets
- Employees
- Return on sales
- Return on assets

Stock returns %

- Award winners
- S&P 500
- Portfolio of all stocks

Stock portfolio

- Low capital intensity
- High capital intensity

Performance measure

- Operating income
- Sales
- Total assets
- Employees
- Return on sales
- Return on assets
Process Improvement and Improved Operating Results

**Financial Performance Indicators**

- Market Share
- $/Emp
- ROA
- ROS

**Operating Indicators**

- Reliability
- On Time Delivery
- Defects
- Lead Time
- Cost of Quality

**Customer Satisfaction**

- Cust. Satis.
- Reduced Cust. Complaints
- Cust. Retention

**Employee Related Indicators**

- Emp. Sat.
- Attend.
- Suggestions
The Axis of Success, A Main Effects Model

- Incentives
- Employee Motivation
- Leadership
- Work Processes
- Customer Satisfaction
Sample Results

- 60% loan origination cycle time
- 30% call center’s first-time call resolution
- 70% state tax filings cycle time & 50% error
- 30% credit card application accuracy
- 12% in the number of “very satisfied” customers
Cultural Impact of Process Improvement

- Common approach to problems
- Common language
- Common values
  - Teamwork
  - Customer focus
  - Process perspective
  - Decisions based on data
  - Bias toward action
What’s in it for employees?

• Improved growth and advancement opportunities
• Jobs with increased variety and autonomy
• Increased opportunities to use valued skills
• Better opportunities to have a significant impact
• Increased employability

Lean six sigma programs lead to increased employee satisfaction.
The bottom line is the bottom line:

• Increased sales to new customers
  1. Positive word-of-mouth
  2. Improved effectiveness of sales and marketing efforts

• Increased sales to current customers
  1. Improved responsiveness
  2. Reduced defects

• Higher margins

• Employee motivation is improved
  » Improved productivity
  » Reduced turnover
How do you implement lean/six sigma
Steering Committee Approach

- Leadership Team
- Steering Committee
- Process Improvement Leader
- Master Black Belt
- Process Improvement Teams
Six Sigma must be treated as an integral part of corporate strategy.
Strategic Issues

When to start?

Where to start?

How fast to go?
When should six sigma be implemented?

- Before or after a reorganization.
- Before or after a downsizing.
- After a merger.
- In response to competition.
- To gain a competitive edge.
- Now.
Where to Start?

Large Payoff

Small Payoff

1. Here First
2. Next
3. Finally
4. Maybe Never

Easy to do. Hard to do.
When Selecting Projects . . .

Issues to consider:

• Customer impact
• Corporate strategy
• Operational impact
• Visibility
• Savings

“This is a must win game.”
- any coach
Businesses Are Processes

Inputs → Processes → Outputs

Your Company
Process Hierarchy

Core Processes Level 1

Forecasting ➔ Program Planning ➔ Staffing ➔ Program Delivery

Sub Processes Level 2

Build Calendar and Format Data ➔ Edit Customer/Forecast ➔ Create and Validate Forecasts ➔ Consensus Meeting ➔ Finalize Forecast

Sub Processes Level 3 (and below)

Create Assumptions and Scenarios ➔ Run Scenarios ➔ Evaluate Scenarios ➔ Select Scenario/Create Forecast

Core Processes Level 1

Forecasting

Sub Processes Level 2

Build Calendar and Format Data

Edit Customer/Forecast

Create and Validate Forecasts

Consensus Meeting

Finalize Forecast

Sub Processes Level 3 (and below)

Create Assumptions and Scenarios

Run Scenarios

Evaluate Scenarios

Select Scenario/Create Forecast

Diagram
How Fast Should Six Sigma be Rolled Out?

- How ready is your organization?
- How committed is top management?
- What resources can you commit to the effort?
- Too slow can be dangerous.
- Too fast can be more dangerous.
Introduction of Advanced Tools

More sophisticated as sigma improves

Variable 1
Variable 2
Variable 3

Control Charts

Outlier
Upper Control Limit
X Average
Lower Control Limit

Time

Design of Experiments

2σ

5σ

Histogram

LSL 51 52 53 54 55 56 57 58 59 60 USL

Variable 1
Variable 2
Variable 3
A Basic Change Process Model

Unfreeze → Change → Refreeze
Organization Change

The System

Socio-tech Perspective

Values

Norms

Roles

Communication Patterns

Work

Processes

Tools

Systems
Lessons Learned

(Usually the hard way)

- It’s all about managing change
- What does the data say?
- Top management leadership is essential
- Start where the organization is
- Build a beach head
- Involve everybody you can – create ownership
- Bake it into your culture
- Create metrics
- Reward success
- Carry the wounded – bury the dead
- *Properly* improving your processes *always* pays
Thank You!