Lean Six Sigma: A Critical Value Driver for 3M
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Lean Six Sigma Evolution

2001 – 2004
Inception
Six Sigma / DMAIC

2005 – 2008
Establishment
Lean Six Sigma

2009 – 2012
Cultural Transformation
Business Execution / Hoshin Kanri

2012 and beyond: deeper Lean penetration in developing markets
LSS deployment in acquisition integration
Increase supply chain optimization focus

65,000 employees trained
73,000 projects closed or in-process
450+ full-time, committed resources globally
720 customer projects either in-process or closed since inception
Lean Six Sigma is creating natural deep connections within 3M

- Common Leadership Language
- Leadership Development
- Best Practice Replication

3M's common language, connecting functions across our global operations

3M's Six Sigma capability continues to grow

- Black Belts in every geographic region
- Over 90% of all employees Six Sigma trained (GB)
- 99% of executives Six Sigma trained
Lean Six Sigma is a major contributor to 3M’s success

**Annual LSS Cost Project Savings**

<table>
<thead>
<tr>
<th>Year</th>
<th>Savings (Billions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>$0.8</td>
</tr>
<tr>
<td>2011</td>
<td>$0.9</td>
</tr>
<tr>
<td>2012e</td>
<td>$1.0</td>
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*LSS projects needed in order to...*

- Fund additional technology development and new product launches
- Finance new plant start-ups
- Offset inflation and other cost increases

*...while at the same time, 3M continues to deliver premium returns*

- Low 20s operating margins and 20%+ ROIC

Creating the fuel to drive continued growth in sales and profits

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3M’s manufacturing & supply chain House of Excellence

Fortifying our operating framework even further

**Vision**

**Primary Lever**

**Key Principles**

**Improvement Targets**

**Primary Initiatives**

**Key Metrics**

**Foundational Enablers For Stability**

**Highest-Quality, Lowest Total Cost & Shortest Lead Time**

**Extended Value Stream Improvement**

**Design**

**Material Flow**

**Quality and Service**

**COGS Improvement**

**Inventory Reduction**

**System Design**

**Material Cost**

**Multi-Source**

**Yield / T-OE, OEE, Unit Cost, DPPM**

**Turns, Cycle Days**

**RSS, T-OE, Tax rate**

**Foundational Stability Tools**

- Kaizen
- Early Supplier Involvement
- Waste Elimination
- Visual Management
- Standardized Work
- Preventive Maintenance
- PDCA Scientific Method
- Robust Products and Processes
Successful business execution requires a disciplined focus on the vital few

- What are the vital few priorities / attributes that MUST be in place in order for an organization to successfully deliver business results?

**Keys for Success**

**Resource Allocation & Alignment**
- Focus on vital few
- Cross-functional prioritization to deliver "the business plan"

**Accountability**
- All key business processes have an A3 owner
- Key business metrics are aligned directly to employee contribution & development plans

**Execution**
- Execution and development mindset is elevated (plans in balance with and align to organization’s capacity to implement)
- Continuous and step-change improvements through business improvement process

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**Using Lean Six Sigma to enable successful in-sourcing**

*Step-change in cost improvement to capture more of the value chain*

**LSS project example – respirator unit cost reduction**

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<tr>
<th></th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
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<tbody>
<tr>
<td>Unit Volume – Millions</td>
<td>0.9</td>
<td>1.3</td>
<td>1.5</td>
</tr>
<tr>
<td>Unit Cost Reduction vs. Outsourcing Option</td>
<td>40%</td>
<td>44%</td>
<td>45%</td>
</tr>
<tr>
<td>Annual Savings - $ Thousands</td>
<td>$400K</td>
<td>$700K</td>
<td>$800K</td>
</tr>
</tbody>
</table>
2012 3M Quality Achievement Award

Business: 3M Communication Markets
LSS Project: Transition from lead to lead-free soldering on single pair protection plugs

GOLD Award Team

ACHIEVEMENTS
- Yield improvements of over 90%
- Shift output improvement by 20%
- Rework reduction of over 65%
- Reduction in power use by 10%
- ZERO customer defects

Customer voices...

Our mission of customer success is paying off across the company
Looking ahead, we are accelerating Lean penetration even further

- Accelerate cash generation
- Reduce costs
- Support growth

In Summary

- 3M’s strong Lean Six Sigma foundation is deeply embedded in our operations and has been a key enabler of 3M’s success
- We are adding resources to further support new manufacturing and supply chain operations in high-growth developing markets
- We will build on and leverage our successes in acquisition integration

Great success thus far, with more opportunity yet to come!