Lean Supply Chain Basics
“Only 7% of companies today are effectively managing their supply chain. However, these companies are 73% more profitable than other manufacturers.”

Deloitte & Touche Study, October 2003
Learning Objectives

At the end of the module, you will be able to:

• Recognize the importance of suppliers in the enterprise
• Describe key attributes of a lean supply chain
• Discuss methods for the improvement of existing supply chains
Suppliers Are Critical In The Value Chain

Synopsis:

- **Customer**
  - Value Specified
  - Value Delivered
- **Product Development**
  - Value Specified
  - Productive Design Meeting Value Expectations
- **Production**
  - Value Created
  - Suppliers as Partners
- **Supplier Network**

**Typically, 60-80% of Value Added by Suppliers**
What Does a Supply Chain Look Like?

End-user

Customer

Prime Mfg./Supplier

First Tier Suppliers

Second Tier Suppliers

Material Suppliers

Raw Material Suppliers

Many transactions are required before the end user obtains the product or service!
Communications across the supply chain is like tossing orders over a brick wall!
1. Gather your team around easel paper or a chart.
2. Discuss each concept on the list below.
3. On your chart, write a prioritized list of concepts that would best create a lean supply chain.

- Collaboration
- Efficient supply chain with little flexibility
- Limited communication
- Localized focus on continuous improvement
- Responsive and agile
- Based on product characteristics
- Enterprise approach
- Long lead times
- One supply chain for all products
- Supplier commitment to long term relationship
- Internal corporate focus
- Build to print
- Visibility of demand
- Continuous improvement activities that include suppliers & customers
Key Attributes of a Lean Supply Chain

1. Alignment of supply chain design with product characteristics
2. Supplier participation in material flow and logistics
3. Supplier involvement in design and development
4. Seamless information flow
1 - Matching Supply Chains with Products

• “Push” supply chain is focused on efficiency for meeting predictable demand at lowest cost.
  - Typically for long product lifecycle and mature or commodity items

• “Pull” supply chain is focused on responsiveness for unpredictable demand to avoid inventory & stock outs.
  - Typically for shorter product life cycle, custom items

• The reality is that a given product may have components of both the efficient and responsive supply chain designs. This approach has been labeled the Hybrid Supply Chain.
2 - Supplier Participation in Material Flow and Logistics

• Just-in-time deliveries
  Eliminates inventory - but parts *must* show up on time!

• Kitting for point-of-use
  Eliminates unpacking, looking for parts - requires supplier involvement in production system design

• Vendor-Managed Inventory
  Vendor owns it, keeps track of it, until it is used

• Third Party Logistics
  Have FedEx handle these?

Different supply chain designs require different practices
**Atlas V Launcher Tubing**

**Old Method**
- Parts individually ordered
- Shipped in bubble wrap and peanuts
- Unpacked at dock – wrapping discarded
- Shelved (using good 5S)
- Fetched when needed – often missing or damaged
- Reordered by schedule or when stock-outs discovered

**New Method**
- Parts shipped in re-usable shadow boxes direct to point-of-use
- Empty box returned, triggers re-order

<table>
<thead>
<tr>
<th>Category</th>
<th>Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inventory Carrying Cost</td>
<td>$35,000 per ship-set</td>
</tr>
<tr>
<td>Internal Handling Cost</td>
<td>$12,000 per ship-set</td>
</tr>
<tr>
<td>Cycle-Time</td>
<td>20 weeks to 14 weeks</td>
</tr>
</tbody>
</table>

Reference: Lockheed Martin Missiles and Space Systems
3 - Supplier Involvement in Design and Development

Early Supplier Integration

SUPPLIER VALUE CREATION
- Major modification to system architecture
  - From “partitioned architecture” to “integrated architecture”
- Reduced Wiring / Connectors
- Reduced unit cost
- Improved reliability
- Re-allocated “Work Share”

SUPPLIER INTEGRATION
- Part of proposal team
- Understood project goals - GOAL CONGRUENCY
- Understood requirement for low cost, seamless assembly

PRODUCT VALUE CREATION
- Original cost est. - $68+ K
- Final actual cost - $15 K
- Unit costs reduced > 75%
- Total savings > $2.9 B

Ref: Lean Enterprise Value, pp 138-140, 206-207
4 - Seamless Information Flow
Requires communication on many levels

Customer

Enterprise Management

Program Management

Procurement & Contracts

Engineering

Manufacturing Operations

Supplier

Enterprise Management

Program Management

Procurement & Contracts

Engineering

Manufacturing Operations

Integrated Information Technology Environment
Exostar Offerings

Supply Chain Visibility
- Inventory Management
- Order Management
- Demand Planning & Forecasting
- Logistics Management
- Spend Management
- Multi-tier Visibility & Process Management

Secure Collaboration
- Process management and workflow
- File sharing and document management
- Project/team management
- Product and design collaboration
- Net meetings and concurrent working

Sourcing
- Supplier Directory
- RFI/RFQ/RFP
- Dynamic Auctions
- Bid Analysis
- Integrated Request for Quote

Procurement
- Indirect Procurement/Requisitioning
- Catalog Management Service

On-line Catalog Sales

Identity Management
- Enterprise PKI credential issuance and management software
- On-demand PKI credential issuance service
- Secure Email Enablement
- Multi-enterprise Single Sign-on

Secure Workflow and Forms Management

B2B Transactional Exchange
- Supplier Web Portal
- Supplier On-boarding & Enablement
- B2B Integration/Data Translation Services

Support Services
- Premier
- Standard
- Enhanced

Courtesy of Boeing. Used with permission.
EXOSTAR Facilitates Supply Chain Management Streamlining

At Rolls-Royce the eProcurement implementation has produced a number of quantitative and qualitative benefits, including:

- Rationalizing the direct supplier base from more than 5,000 to several hundred
- Reduction in cost of goods of up to 20%
- Reduction in inventory value levels as much as 80%
- Reduction in errors due to the elimination of manual re-keying of buying data
- Reduced cycle time, in some cases by up to 80%
- Near-elimination of paper and fax processes
- Improved relations with suppliers, who have benefited from reduced transaction costs and improved efficiency
Improving Supply Chains

Prime Contractor Owns The Vision

Supplier Owns The Vision

Lean
Assessment
& Value Stream Mapping

- Enterprise-Level Analysis
- Product-Level Analysis
- Basis for Improvement Plans

Lean Strategy & Deployment Plan

- Common Objectives
- Common Metrics
- Plans of Action
- Timelines

Continuous Improvement

Lean Engagements

- Improvement Workshops
- Additional Training

Education & Orientation

- Compelling Interests
- Building the Relationship
- Understanding Context
- Commitment to Go Forward

Lean
Engagements

Lean
Ready?

No

Work Outstanding Issues

Supplier Selection

Value Stream

Program

• Critical Path
• Cost
• Quality
• Cycle Time
• Delivery

Yes

Lean Ready?
Example: Hicksville Machine Works Corp.

- Supplier worked with prime to implement lean
- Prime (Boeing) provided expertise and training for 5S, Statistical Process Control, and Set-up Time Reduction
- Savings shared, plus many additional benefits:

“... a good example of what good team work between a vendor and sincere Boeing personnel, ... can do. ... my Company is much more competitive than ever before. Following are some of parts we were able to reduce the unit prices on:

<table>
<thead>
<tr>
<th>P/N</th>
<th>Previous Unit Price</th>
<th>New Unit Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>17P2A5224-1NC</td>
<td>$1815.00</td>
<td>$751.68</td>
</tr>
<tr>
<td>17P2A5821-1</td>
<td>$1992.00</td>
<td>$639.33</td>
</tr>
<tr>
<td>17P2A5829-1NC</td>
<td>$2531.72</td>
<td>$1024.00</td>
</tr>
</tbody>
</table>

These types of savings will apply to all parts we manufacture.”

-Jack Spezio, President
Supply Base Stratification - Five Levels

- **Strategic Alliance**
  - Certified
    - Gold, Silver, Bronze, Probation
- **Strategically Important**
- **Core**
  - High Performing, Standard, Potential, Legacy
- **Disengaged**

Courtesy of Boeing. Used with permission.

Source: The Boeing Company
**Future State in Lean Relationships**

**“Old” Approach**
- Rigid vertical interfaces and control

- Customer
- Prime
- Subcontractor

**“Current” Lean**
- Collaborative with rigid organizational interfaces

- Customer
- Prime
- Subcontractor

**“Emerging” Lean**
- Virtual Team without boundaries enabling continuous innovation

- Customer
- Prime
- Subcontractor
Lean Supply Chain Wrap Up

- Suppliers are critical to lean enterprise success
- Supply chains need to be understood and designed to meet the needs of the product enterprise needs
- Legacy supply chains can be improved through win-win customer-supplier teamwork.

Supply Chain Management is a lean enterprise core competency
Exercise

• What aspects of a Lean Supply Chain can you implement today to improve your enterprise’s performance?

• Spend the remaining time capturing these on an easel chart for your team’s use.


Kraljic, "Purchasing Must Become Supply Management," HBR, September - October 1983


Venkatesan, "Strategic Sourcing: To Make or Not to Make," HBR, November-December, 1992
Acknowledgements

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• Kirk Bozdogan - MIT LAI
• Tom Callarman - ASU
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• Greg Harris - Univ. of Alabama in Huntsville (UAH)
• Dick Lewis - Rolls-Royce (ret.)
• Hugh McManus – Metis Design
• Earll Murman - MIT
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