Supplier Networks Working Group

The *Lean Supply Chain Now* Pilot Demonstration Project

Presented by
Kirk Bozdogan, MIT
Hamid Akhbari, US Air Force
Chris Darden, Northrop Grumman

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Supplier Networks Working Group

Mission: Enable the development of lean, value-creating, US aerospace supplier networks

Focus:
- Help enhance aerospace supply chain management capabilities
- Help streamline vertical interfaces in the supply chain
- Enable collaborative arrangements to improve performance of supplier networks
Emphasis Today

• **Supplier Networks Transformation Toolset** --
  Integrated implementation toolset for building lean supplier networks

• **Lean Supply Chain Now pilot demonstration project** --
  New initiative to develop a validated deployment model for redesigning and streamlining vertical interfaces in the aerospace supply chain to achieve significant performance improvements (cost, quality, delivery)
ROADMAP for building lean supplier networks
How-to, who, when, where

RESOURCE GUIDE
For smaller suppliers (Lean diagnostic; “yellow pages”)

SUPPLIER MANAGEMENT SELF-ASSESSMENT TOOL
What, current state, future state

OBJECTIVE: Develop integrated lean, value-creating, supplier networks
**SUPPLIER TOOLSET VERSION 1.0**—Available Now

**OBJECTIVE:** Develop integrated lean supplier networks transformation toolset

**ROADMAP:** Major Building Blocks

- **1.0** DEFINE VISION
- **5.0** IMPLEMENT LEAN INITIATIVES
- **2.0** DEVELOP SUPPLIER NETWORK STRATEGIC PLAN
- **3.0** ESTABLISH LEAN CULTURE AND INFRASTRUCTURE
- **4.0** CREATE AND REFINE LEAN IMPLEMENTATION PLAN
- **6.0** STRIVE FOR CONTINUOUS IMPROVEMENT

**RESOURCES:**

- **DESK REFERENCE**
  - Principles
  - References
  - Glossary
- **RESOURCE GUIDE**
  - For smaller suppliers (Lean diagnostic; "yellow pages")
- **SUPPLIER MANAGEMENT SELF-ASSESSMENT TOOL**
  - What, current state, future state

**LEVELS**

- **Level I**
  - Traditional
    - Very little awareness of this practice; sporadic improvement activities may be under way in a few areas.

- **Level II**
  - Adopter
    - General but limited awareness; informal and piecemeal approach deployed in a few areas focusing on specific projects with varying degrees of effectiveness and sustainability.

- **Level III**
  - Performer
    - A systematic approach is deployed in all appropriate areas, functions, and processes, with appropriate metrics; varying stages of implementation across most areas, exhibiting varying degrees of success; some deployments are still in relatively early stages.

- **Level IV**
  - Reformer
    - On-going deployment, refinement and continuous improvement of applicable practices across the enterprise, facilitated by the use of appropriate metrics, exhibit mature, well-developed approach.

- **Level V**
  - Transformer
    - Exceptional, well-defined, innovative approach is fully deployed across the extended enterprise; recognized as world-class best practice.
Desk Reference

• **Objective:** Provide a comprehensive and “useful” reference for lean supply chain management

• **Scope:** Identify and elaborate basic concepts, definitions, tools and techniques, and provide references for further learning

• **Target:** Lean enterprise transformation champions; supply chain managers from across the enterprise

• **LAI’s value-added role:** Providing educational material for use by the US aerospace community
Resource Guide

- **Objective**: Provide useful and comprehensive reference guide on lean manufacturing basics
- **Scope**: Identify and elaborate concepts, definitions, tools & techniques and provide references
- **Target**: Medium and small-size suppliers, as well as by primes and major suppliers
- **LAI’s value-added role**: Providing off-the-shelf educational and informational material that would help raise the awareness level of small and medium-size aerospace enterprises on lean basics and where to seek further assistance
Toolset Development: Status

- **VERSION 1.0 -- Roadmap & Self-Assessment tools**
  - Alpha & beta-tested
  - Integrated toolset completed in March 2004
  - Document version available on LAI website
- **VERSION 1.1 -- Add Desk Reference module**
  - Core lean concepts & principles for supply chain management
  - Tools and techniques
  - Implementation examples
  - In-progress
- **VERSION 1.2 -- Add Resource Guide module**
  - Basic lean manufacturing principles
  - Resource guide for smaller suppliers ("yellow pages plus")
  - In-progress
Supplier Networks Working Group

Exploring collaborative opportunities for enabling the development of lean, value-creating, aerospace supplier networks

- **Flowing lean to the lower-tier supplier base**
  - Huge challenge, basically outside LAI’s scope
  - But LAI can help “enable” collaborative action -- Example: Leveraging EdNet to help stakeholder member companies, in collaboration with local Manufacturing Extension Partnership (MEP) centers & other lean-delivery organizations

- **Helping to streamline *vertical interfaces* in the supply chain -- to drive out waste, speed flow, and improve quality**
  - Target of opportunity for LAI
  - Working group exploring opportunities for collaborative action
Exploring Opportunities for Leveraging Capabilities through Collaboration

Requirements & Needs

Customers (e.g., SPOs)

Primes

Partners

First Tier

Second Tier

Third Tier

Existing, Funded Capability

Fragmented, Duplicative Support

Enabling Products & Services

AIA: Aerospace Industries Association
CMTC: California Manufacturing Technology Center
LAI: Lean Aerospace Initiative
MEP MSI: Manufacturing Extension Partnership Management Services, Inc.
NACFAM: National Coalition for Advanced Manufacturing
NIST-MEP: National Institute of Standards and Technology Manufacturing Extension Partnership
SEA: Supplier Excellence Alliance
360 vu: 360 vu Research & Education Foundation

web.mit.edu/lean

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Lean Supply Chain Now -- Some Background

- Responds to need for greater value delivery in three major areas identified in a recent reassessment of the LAI value proposition:
  - **Improving industry-supplier interfaces**
    - Streamlining transactions, institutionalizing lessons learned, sharing data & networking
    - Developing standardized tools, implementation methods, processes & metrics that primes and major suppliers can use as they interface with their lower-tier suppliers
  - **Helping with deployment of tools within industry**
    - Providing assistance with tools (access, deployment)
    - Promoting wider deployment of tools across industry
  - **Establishing collaborative relationships with “lean-enabling” third parties**
    - Supplier transformation -- improving supplier processes
    - Supplier training -- improving supplier capabilities to learn
- Supports other initiatives addressing subcontracting management and supply chain integration issues (e.g., DCMA, AFMC, primes, major suppliers)
Lean Supply Chain Now -- Builds on Lean Now Success

-- LAI consortium working together

- A Government Initiative...a total enterprise team facilitated through the LAI venue
- GOAL: Help with transformation of government enterprises
- Leverages collective knowledge to eliminate barriers...capitalize on government and industry teamwork
- Industry’s experience in large-scale enterprise-wide change
- Cadre of coaches... Subject Matter Experts (SMEs)
- Spiral approach

Accelerate value creation and eliminate non-essential activity – Apply lean principles to government-industry critical processes:

1. User-SPO-industry program interfaces
2. AF-industry business processes
3. AF-industry operating processes
Lean Supply Chain Now -- Executive Summary

• **Purpose:** Demonstrate through a pilot project that lean-enabled streamlining of vertical interfaces in the supply chain can achieve significant performance improvements (cost, quality, delivery)

• **Anticipated benefits:**
  - Provide verified data rather than conjecture that can be extrapolated to the program level to establish ROIs on future lean investments by the DOD and primes
  - Document a set of lean best practices and recommendations
  - Establish a set of lean supplier networks metrics
Lean Supply Chain Now Pilot Project -- Hypothesis & Methodology

• Hypothesis:
A supplier network with streamlined vertical interfaces between customers and suppliers in the multi-level DOD supplier base, enabled through “lean-intervention,” provides superior performance in terms of cost, quality and delivery.

• Methodology:
Test for significant differences between the performance of a supplier network receiving “lean-intervention” (serving as the experimental group) AND the performance of another, equivalent, supplier network not receiving such “lean-intervention” (serving as the control group), where the observed performance differences can be directly attributed to the “lean-intervention” event.
Lean Supply Chain Now -- Some Operational Details

• Directly focusing on critical vertical interface issues in the supply chain (e.g., requirements flowdown)
• Deploying LAI tools and methods, as well as supplier lean development tools and best practices from all member organizations to redesign and streamline vertical interfaces
• Demonstrating concept through test-bed application in one or more pilot projects framed around major acquisition program enterprises (e.g., Global Hawk, C-17, F/A-22), by conducting a controlled experiment
• Concentration on common suppliers & drilling down vertically to subtier level in the supply chain
• Establishing collaborative relationships for lean deployment
  • AFMC: Transformation (Acquisition, Sustainment)
  • System Program Offices (SPOs)
  • DCMA, DFAS
  • Primes; major subcontractors/suppliers; lower-tier suppliers
  • LAI Supplier Networks Team
  • “Lean-delivery” service organizations; “Lean-enabling” alliances
• We are on our way towards fleshing out an executable plan
Pilot Project Process

- Develop concept and draft execution plan
- Provide briefings to leadership and get buy-in
- Obtain go-ahead & budgetary support
- Develop detailed design and implementation plan
- Conduct data collection and analysis
- Document pilot project results
- Brief results and build wider acceptance of deployment model
- Prepare and provide portable deployment package
Design Pilot Project as a “Controlled” Experiment

Program A/Prime A

Test Group 1

Supplier A

Test Group 2

Supplier B

Control Group

Supplier C

Supplier D

Supplier E

Supplier 1

Supplier 2

Supplier 3

Supplier 4

Supplier X

Supplier Y

Supplier Z

Tier 1

Tier 2

Tier 3

Develop Metrics & Baseline Performance 
(Supply Chain)

Develop Metrics & Baseline Performance 
(Supplier)

Interface Event

Lean Improvement Implementation (“lean-intervention”)
Interface Focus

Vertical Interfaces
- Number of transactions
- Time it takes
- Number of times there are problems
- Number of people
- How automated
Key Interfaces Identified

Contractual Interfaces

- Proposal
  - RFP / RFQ
  - Proposal Preparation
- Contract Modifications
  - Types – Schedule, Technical
  - Interface levels –
    - Customer to Prime
    - Prime to Supplier (Supplier Mgmt)
    - Supplier to Lower Tiers (Supplier Mgmt)
- Requirements / Qty Flowdown
- Contract Design
  - Long Term Agreements (Compare / Contrast)
- Interface Levels
  - Customer to Prime
  - Prime to Supplier
  - Supplier to Lower Tiers
- Negotiation, Evaluation (Rates, etc)
Key Interfaces Identified

Technical Data Interfaces

- **Requirements Flowdown**
  - Engineering Specs
  - Material Specs
  - Audits
  - Delivery Requirements
  - Packaging
  - Part Qualification Process
    - Testing Requirements
    - First Article Inspection

- **Configuration Change Management**
  - Engineering Changes (ECO)
  - Manufacturing Requirements Changes
Key Interfaces Identified

Physical Parts Interfaces
- Schedule communication and integration (Lead-time)
- Change order implementation
  - Manufacturing and Inventory Mgmt response to Change Orders
  - Part Qualification

Other Interfaces
- Business Systems (Connectivity)
  - Electronic Payments
  - Electronic P.O.
  - Engineering Drawings
  - Forecasts
- Audits
  - Multiple Audits = Redundancies
  - ISO9000, BQMS, Quality Audits,
- Supplier Scorecards / Ratings
  - Multiple Ratings – Redundancies
  - Multiple Criteria
Refining the Concept -- Current Activities

- **Business model** -- stakeholders, value exchange, roles and responsibilities
- **Pilot design** -- controlled experiment, interfaces, lean intervention strategies, benefits and costs
- **Execution plan** -- engagement strategy, implementation steps, tools & techniques, resource requirements, schedule, change process documentation
- **Outreach plan** -- marketing & communication plan
Pilot Project -- Expected Results

- Validated, action-oriented, **portable deployment model** for streamlining vertical interfaces in the supply chain
- Integrated implementation tools & techniques
- Business case -- metrics for quantifying benefits and costs
- Capturing lessons learned to define most effective methods for overcoming barriers
- Collaborative framework for bringing about fundamental changes
Points of Contact

• Kirk Bozdogan, MIT
  Tel: 617 253-8540
  e-mail: “Bozdogan, Kirkor” <bozdogan@mit.edu>

• Hamid Akhbari, US Air Force
  Tel: 937 255-9883
  e-mail: "Akhbari, Hamid R Civ ASC/ENSM"
  Hamid.Akhbari@wpafb.af.mil

• Chris Darden, Northrop Grumman
  Tel: 310 332-0861
  e-mail: "Darden, Chris" <chris.darden@ngc.com>