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:

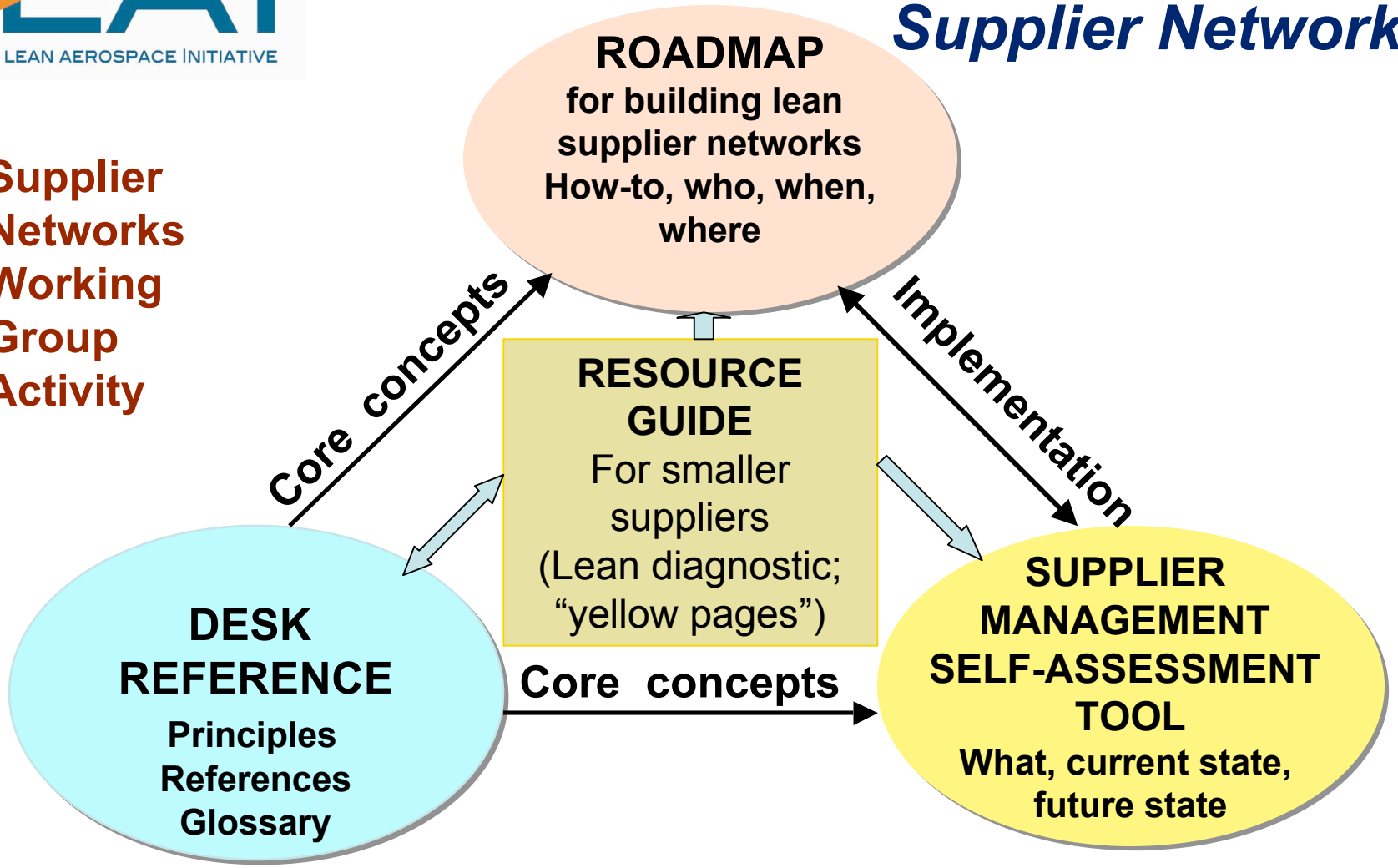
- **Help enhance aerospace supply chain management capabilities**
- **Help streamline vertical interfaces in the supply chain**
- **Enable collaborative arrangements to improve performance of supplier networks**

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)

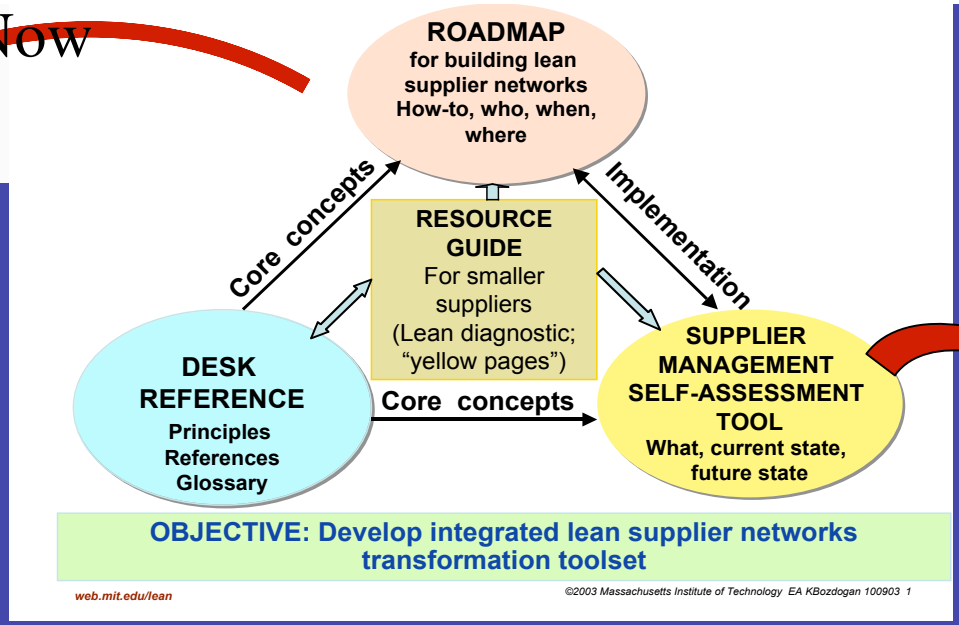
TOOLSET Can Help Accelerate Transformation of Supplier Networks

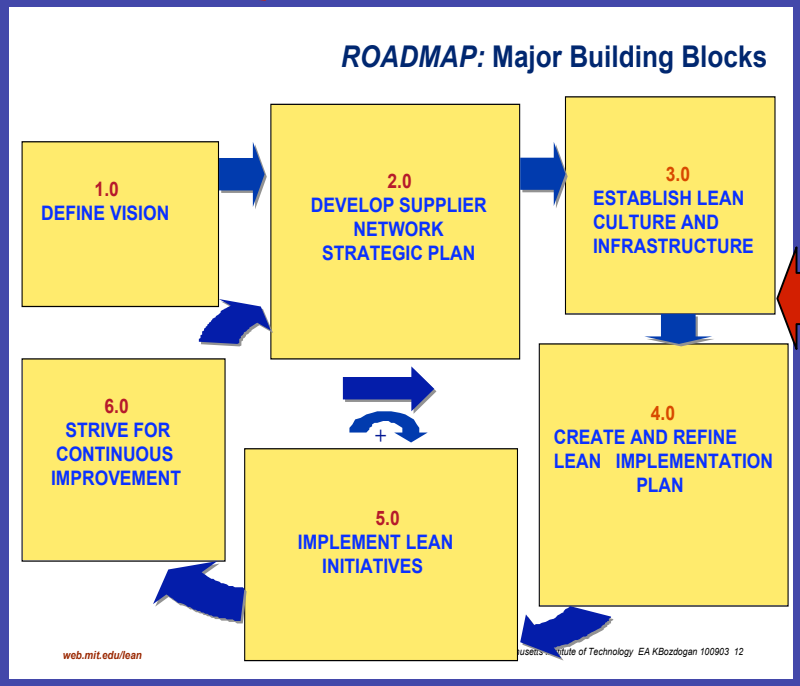
Supplier Networks Working Group Activity



OBJECTIVE: Develop integrated lean, value-creating, supplier networks

SUPPLIER TOOLSET VERSION 1.0-- Available Now





Supply Chain Management Capability Maturity 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.

web.mit.edu/lean

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

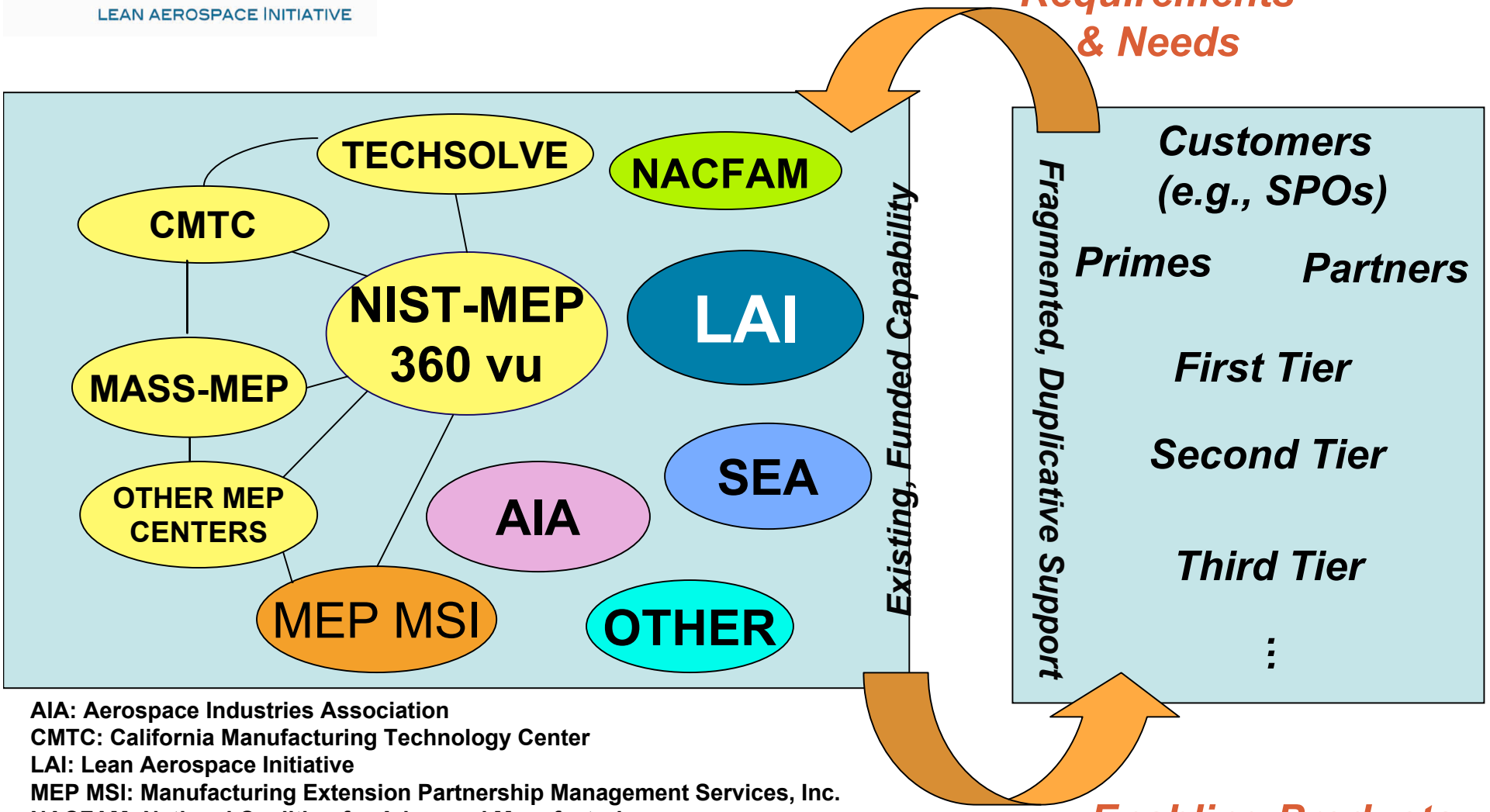
  ⇒ But LAI can help "enable" collaborative action -- Example: Leveraging EdNet to help stakeholder member companies, in collaboration with local Manufacturing Extension Partnership (MEP) centers & other lean-delivery organizations

- **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



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

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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

LEAN AEROSPACE INITIATIVE

Lean Now -- 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.

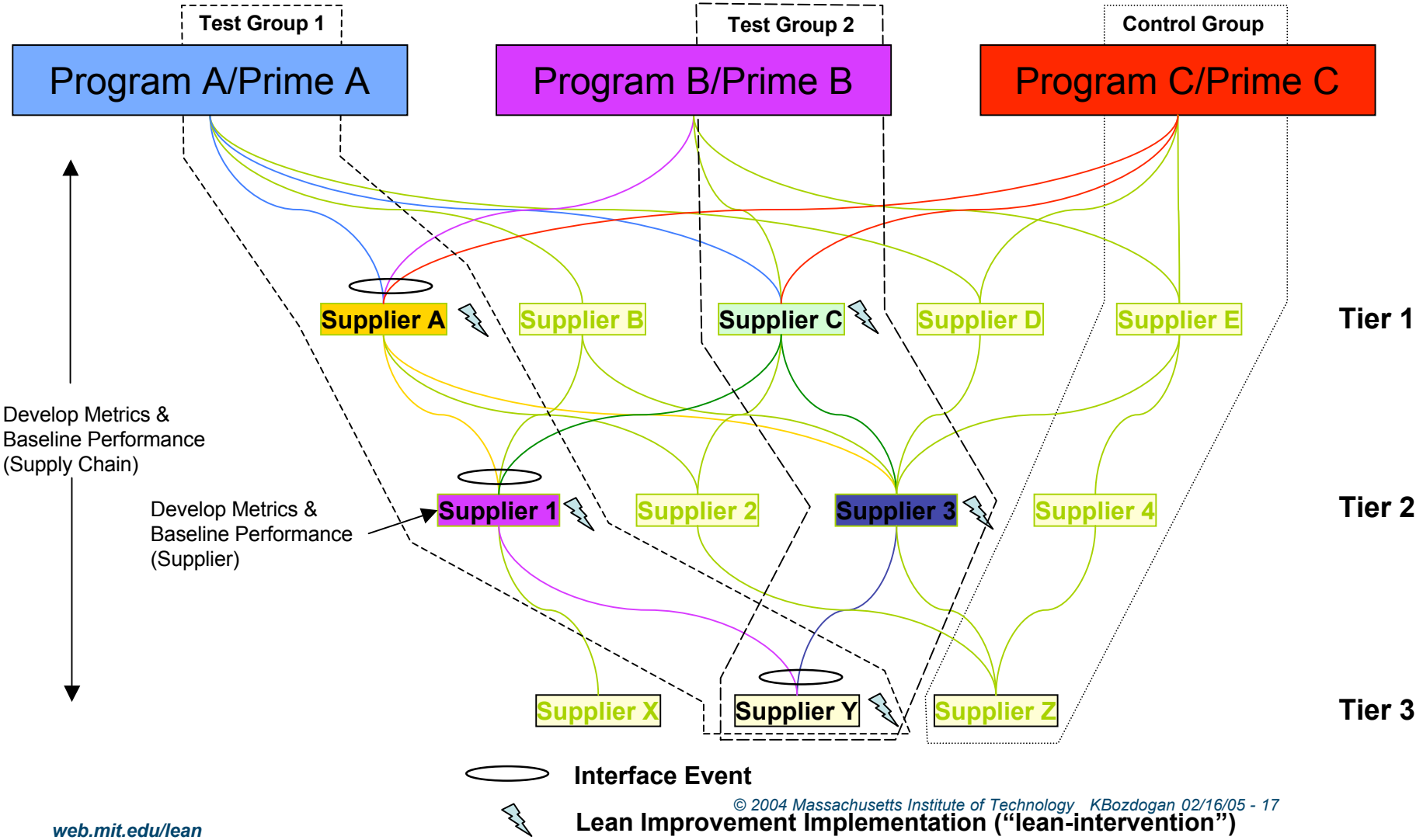
Lean Supply Chain Now -- Some Operational Details

- 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

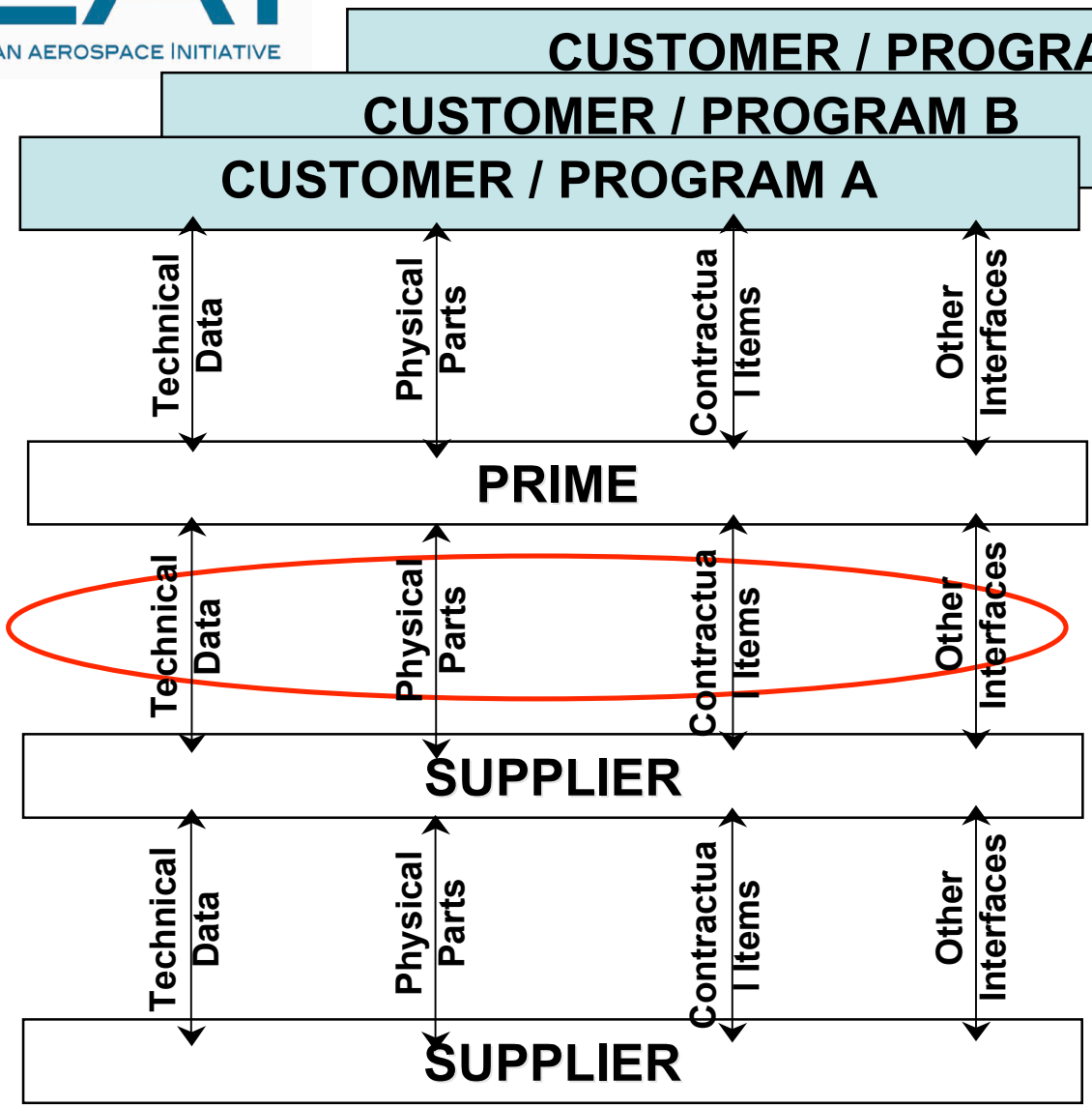
Pilot Project Process

- 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



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>

