Enterprise Value: The New Lean Horizon

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Presented By:
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LAI Co-Director
The Lean Aerospace Journey: A People, Process, and Product Evolution

Lean Enterprise

Lean Factory

Lean Auto Factory

Toyota Production System

Lean Enterprise Model

Transition to Lean Roadmaps (TTL)

Lean Enterprise Self Assessment Tool (LESAT)

LAI Book

LAI Phase I

LAI Phase II

LAI Phase III

1993

1996

1999

2002
Islands of Success

C-130J production
- Throughput of extrusion shop from 12 days to 3 minutes

Automatic code generation
- 40% reduction in time
- 80% improvement in quality

Military electronic modules from commercial lines at TRW
- 73% cost reduction

F-16 Build-to-Print Center
- 75% cycle time reduction

777 floor beam
- 47% assembly time reduction

P & W General Machining Center
- 67% reduction in lead time

Delta IV launch vehicle
- 63% reduction in floor space

GE Lynn aircraft engine facility
- 100% on time deliveries

Joint Direct Attack Munition (JDAM)
- 63% reduction in unit cost
Enterprise Insights

- Transformation is continuous and takes years, not months.
- Senior executive leadership, commitment, and involvement are critical success factors in enterprise transformation.
- Biggest challenges is institutionalizing lean and sustaining the change.
- Focusing on time forces everyone to think of the “enterprise”.
- Enterprises must be viewed as a holistic system.
- Substantial Potential in Enterprise.
Evidence of Lean Potential in An Enterprise

- F-16 maintained sales price and decreased order-to-delivery time by up to 42% while production rate decreased 75%
- C-17 unit priced decreased from $260M to $178 M for final 80 aircraft of 120 aircraft buy.
- Northrop Grumman ISS lean enterprise implementation reduced throughput times for major systems by 21 to 42%.
- F/A18-E/F EMD completed on time, within budget (without rebaseline) while meeting or exceeding performance requirements.
- Raytheon realized $300M FY 2000 bottom line benefits from its enterprise wide Six Sigma program
Lean is not just a matter of eliminating waste, rather becoming lean is a process of eliminating waste with the goal of creating value for enterprise stakeholders.

Lean Enterprise Value, Palgrave Publishing
New Lean Thinking: Evolving Paradigms

Craft Production

Mass Production

Toyota Production System

Lean Enterprise

Lean Enterprise Value
“The core challenge for industry in the 21st century involves identifying and delivering value to every stakeholder. Meeting that challenge requires lean capability at the enterprise level.”
Creating Value

Delivering what stakeholders want and need.

For example:

- Timely, quality products at a reasonable price to customers
- Competitive returns on investments to shareholders
- Rewarding work environment, stable jobs for workforce
- Environmental and civic responsibility to the public
Three Levels of an Enterprise

- **Program**: F22
- **Corporate or Government**: Boeing, Lockheed Martin, USAF
- **National or International**: Primes, Government, Suppliers

Life Cycle Processes  Enabling Infrastructure Processes  Enterprise Leadership Processes
Enterprise Example: JSF Mega Program

Centralized Control

Decentralized Execution

Status at a Glance Metrics

Rapid Decision Making

Flexible Repositioning

World Class Team

Supply Chain Management

UK Ownership

BAE SYSTEMS

NG ACS

LM Aero

LMIS

JSFPO

Major Critical Suppliers

Mission Systems

Vehicle Systems

Support

Airframe

Training

Source: Tom Burbage, Lockheed Martin Aeronautics

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web.mit.edu/lean
## A Value Creation Framework

<table>
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<th>Enterprises</th>
<th>Value Phases</th>
<th>Opportunities</th>
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<td>Program</td>
<td>Value Identiﬁcation</td>
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<td>Corporate Government</td>
<td>Value Proposition</td>
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<td>National International</td>
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Most lean principles and practices have been focused here.
Lean Enterprise Value Principles

- Create lean value by doing the right job and doing the job right
- Deliver value only after identifying stakeholder value and constructing robust value propositions
- Fully realize lean value only by adopting an enterprise perspective
- Address interdependencies across enterprise levels to increase lean value
- People, not processes, effectuate lean value
Stakeholder Enterprise Insights at this Conference

Bob Nelson, Corporate Vice President Business Strategy, Northrop Grumman Corporation

Heidi Wood, Executive Director, Senior Aerospace & Defense Analyst, Morgan Stanley

Tom Allen, Professor MIT Sloan School of Management

Carolyn Corvi, Vice President-General Manager- Boeing 737 Program

Mike Fortson, Director, Joint Strike Fighter Affordability

Mike Gass, Vice President, Atlas Program Lockheed Martin Astronautics

and

Nine Break Out Sessions
Realizing Our Potential

Lean Aerospace Initiative

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Opportunities

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