We Share A Goal: Enterprise Excellence
Enabling Enterprise Excellence

Discovery - Deployment - Renewal

Research Shapes Deployment

Enterprise Research
We study Enterprises to identify best practices, transformation strategies and future Enterprise architectures

Transformation Knowledge Deployment
We transform research-based knowledge into education, products, knowledge exchange events, and transformation events

Deployment Shapes Research

Stakeholder-Centric Value Creation
LAI Operating Model

- Enable Transformation
- Exchange Knowledge
- Measure Value

- Accelerate Deployment
- Engage all Stakeholders
- Collaborate To Transform

- Conduct Enterprise Research
- Develop Transformation Products

LAI Operating Model

- Deploy Knowledge
- Enable Enterprise Excellence
- Create Knowledge

Collaborate
Enterprise Strategic Analysis for Transformation (ESAT)

- Focuses on Enterprise-wide processes
- Provides a cohesive method for diagnosing an Enterprise to expose sources of waste and barriers to value delivery
- Considers the needs and values of all Enterprise stakeholders

ESAT
An integrated, analytical framework for diagnosing and improving overall Enterprise performance.

- Identifies process interfaces, disconnects, and delays
- Establishes an Enterprise vision for the future
- Identifies improvement opportunities that will lead the Enterprise to its future state
LAI Enterprise
Self-Assessment Tool (LESAT)

Downloaded more than 3,400 times since 2003

LAI Research
EVSMA
ESAT
Theses

LAI Consortium
Usage Experience

Raytheon
Boeing
Pratt & Whitney
Rockwell Collins
Northrop Grumman
USA

http://lean.mit.edu
Version 2.0 development team includes 20+ participants from US, UK, and Australia

Schedule aligned with DoD effort on systems engineering effectiveness

Incorporated in IBM Rationale Product Suite

NAVAIR’s Systems Engineering Development & Implementation Center (SEDIC) using SE leading indicators to develop advanced analysis techniques and toolkit for Navy programs

Six new leading indicators to be added to current 13

New information and real-world examples will be included

“The leading indicators project is an excellent example of how academic, government and industry experts can work together to perform collaborative research that has real impact on engineering practice”

Magazine March 2007
Cost Modeling

Policy & Contracts

Commercial Implementations
- SystemStar™
- SEER®
- PRICE
- The Constructive Systems Engineering Cost Model (COSYSMO)

Proprietary Implementations
- SEEMaP
- COSYSMO-R
- SECOST
- Systems Eng. Cost Tool

COSYSMO Model

10 Academic Theses

Academic Curricula

Deploy
Enable
Create
Collaborate
Knowledge Exchange Events

**CHANGE MANAGEMENT**
Knowledge Exchange Event
**October 2008**

- Taught and applied the five Enterprise Change Capabilities
- 16 participants
- Visited P&W EHRO facility to apply and present findings
- EHRO Facility reviewed and implemented suggestions

Event was hosted by:
Pratt & Whitney
A United Technologies Company

**ESAT**
Knowledge Exchange Event
**Sept. 2008**

- Event was hosted by: U.S. Army

**METRICS**
Knowledge Exchange Event
**November 2008**

- Event was hosted by: Raytheon
Community of Practice

A knowledge creating community that collaboratively solves hard, real-world problems

- Active participation
- Open and honest sharing

Product Development Community of Practice

- LAI’s third PD benchmarking event hosted by Raytheon in June 2008 at the University of Arizona.
- Collaboration with Technical University of Braunschweig for global benchmarking of implementation of Lean practices in PD.

Metrics Community of Practice

- Group’s second KEE was hosted by at Raytheon in Andover, MA, in November 2008
- LAI continues to contribute to measurement initiatives at Raytheon and Lockheed Martin
- Joint measurement workshop planned for May 2009
Addressing Open Challenges

**Boeing Phantom Works**
- LAI developed a roadmap for enabling rapid certification of aerospace embedded software systems

**Rockwell Collins**
- LAI shared lessons learned on creating systems of innovation,
- Identified areas of future research with the Global Technology development team at Rockwell Collins
Knowledge Sharing with Consortium Partners

- Professor Nightingale spoke on Enterprise Transformation at the Army ASA(ALT) Leadership Conference, November 2008

- Professor Nightingale shared Enterprise Transformation strategies with Boeing Lean+ Corporate Leadership, September 2008

- BAE plc Executive and LEPD Workshops, May 2008
  - LAI team taught a day-long executive workshop followed by two 2-day Enterprise-focused engineering workshops for 120+ senior BAE engineers

- LAI and EdNet educated 36 military and civilian leaders at Edwards Air Force Base, May 2008
Unique New International Journal

- Forum for articles on trends, new findings, and ongoing research on Enterprise Transformation
- Interdisciplinary research in management, industrial & systems engineering, information systems, organizational behavior, political science, and economics

- Partnership with the Institute of Industrial Engineers (IIE) and the International Council on Systems Engineering (INCOSE)
- Professor Nightingale and Dr. Ricardo Valerdi will serve as inaugural editors
- Associate editors from Europe, Asia, and the United States

- First Issue in early 2010
2009 LAI
Enterprise Transformation Research Summit
A Day-Long Overview of LAI’s
Enterprise Research, Insights, Findings, and Applications

Focused on LAI modes of doing Enterprise research:

- Developing and Deploying Enterprise models into practice and engagement
- Creating powerful partnerships for research and engagement
- Strengthening Enterprise performance with competency and collaboration models
- Learning from case studies
- Addressing Enterprise processes

Provided a mechanism to:

- Rapidly disseminate learning
- Highlight key areas from members that need further work

Videos
Thirteen presentations from this Research Summit are on video and can be viewed on our website (http://lean.mit.edu) and on MIT TechTV (http://techtv.mit.edu)
Highlights of Emerging Research

Chris Glazner
MIT Degree Candidate:
Ph.D., Engineering Systems, 2009

- Strategic-level modeling and simulation of Enterprise Architecture to address key question directly affecting bottom-line results
  - Analyzes investment tradeoffs across multiple business units
  - Provides guidance on how to most effectively incentivize a company’s business units and allocate R&D discretionary budget

“Modeling and Understanding Enterprise Behavior Using a Hybrid Simulation Approach”

Presented by
Chris Glazner
at the
LAI 2009 Enterprise Transformation Research Summit

See this presentation on Video
at the LAI website (http://lean.mit.edu)
and at MIT Tech TV (http://techtv.mit.edu)
Highlights of Emerging Research

Major Robb Wirthlin
United States Air Force
MIT Degree Candidate:
Ph.D., Engineering Systems, 2009

- Developed and empirically validated integrated model of the USAF requirements, planning, budgeting, and acquisition systems
- Anomalous behaviors of acquisition are in fact emergent behaviors of a much larger, complex system
- Prior studies suggest many of the ‘pathologies’ outside of the control of the acquisition managers

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<th>Pre-MS “B” (Technology Development)</th>
<th>Pre-MS “C” (System Development &amp; Demonstration)</th>
<th>Pre-Full Rate Production (Production &amp; Deployment)</th>
<th>Operations and Sustainment</th>
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“Identifying Leverage Points in Defense Acquisition Program Performance”

Presented by
Major Robb Wirthlin
at the
LAI 2009 Enterprise Transformation Research Summit

See this presentation on Video
at the LAI website (http://lean.mit.edu)
and at MIT Tech TV (http://techtv.mit.edu)
Welcome

The Lean Advancement Initiative offers organizational thinking, products, and unique research consensually learned, and best practices.

LAI offers:

- Unique opportunity and share organizational
- A portfolio of tools and innovative enterprises

Vision

LAI’s work is designed to enable enterprises to effectively, efficiently, and reliably create value in complex and rapidly changing environments.

Mission

LAI enables the focused and accelerated transformation of complex enterprises through collaborative stakeholder engagement in developing and institutionalizing principles, processes, behaviors, and tools for enterprise excellence.

Everything Is Here: lean.mit.edu
Adoption of Measurement Tools at BAE Systems and Raytheon

LAI Researcher Dr. Ricardo Valerdi | 00:13:00

What Makes measurement systems Adoptable?

- Well documented
- Trialability
- Low barrier of entry
- Transparency
- Demonstrates value
- Variety of incentives
- Agility
- Flexibility
- Failure modes
- Enabled by IT
- Data validity/integrity
- Tailorable
- Information freshness
- Relative advantage
- Compatibility
- On-going peer support
- Credibility

Videos
- LAI Overview
- LAI Research Overview
- Adoption of Measurement Tools at BAE Systems and Raytheon
- Modeling and UnderstandingEnterprise Behavior Using a Hybrid Simulation Approach
- Overview of LAI Partnership Model
- Applying Enterprise Architecting within the Army Transformation
- Architecting the Healthcare System for Stakeholder Value
- Establishing Systems Competency in Enterprises: Recent Studies
- A Case Study of Lean Transformation at Rockwell Collins: Part I
- A Case Study of Lean Transformation at Rockwell Collins: Part II
- Making the Transition to Lean Product Development
- Facilitating Communities of Practice and Benchmarking
LAI Synergies

LAI Communities of Practice

MIT School of Engineering

SEA

MIT LFM
Leaders for Manufacturing

MIT Sloan Management

MIT System Design and Management

EdNet
LAI Synergies

- Second Annual MITRE-MIT Enterprise Modeling Exchange
- Centro de Estudos e Sistemas Avançados do Recife
- INFORMS Conference
- Air Force Office of the Surgeon General: "Economics of Human Systems Integration"
- International Conference on Global Software Engineering
- Boeing Lean+ Conferences
- 2nd International Engineering Systems Symposium
- DTE/SoL CPI Seminar
- International Conference on Global Software Engineering
- PRI Workshop on Innovation in Services
- XP 2009
- BAE Lean+ Conferences
- Estimating and Managing Through-Life Costs, University of Bath (U.K.)
- International Conference on Global Software Engineering
- Systems Thinking In Action Conference
- HaCIRC Healthcare Symposium, Imperial College, London
- 2009 INCOSE Symposium
- Workshop on Innovation Management 2009
- Boeing-Rocketdyne LN2LN Conference
- WCBF Benchmarking Forum
- Rockwell Collins Technology Sensemaking Exercise/System of Innovation
- Enhancing Continuous Improvement Through Organizational Learning
LAI will continue unique focus on large-scale Enterprise architecting and transformation

“Pull” from other sectors for Lean Enterprise thinking

Increase National and International impact
Upcoming Events

**Lean Educator Conference**

*Education & Industry - Sharing Lean Concepts*

**May 28-30, 2009**

**University of Minnesota,**

**Minneapolis, MN**

[www.lean.org/events/calendar](http://www.lean.org/events/calendar)
Upcoming Knowledge Exchange Events

- **May 14, 2009**
  - **Knowledge Exchange Events**
  - **Using LESAT for Transformation**
  - **Host:** MIT, Cambridge, MA

- **August 4-5, 2009**
  - **Knowledge Exchange Events**
  - **Sustaining Lean Practices Through Industry Education**
  - **Host:** Boeing, Seal Beach, CA

- **October 28-30, 2009**
  - **Knowledge Exchange Events**
  - **Sharing Lean Change Success Stories**
  - **Host:** TBD

- **November 4, 2009**
  - **Knowledge Exchange Events**
  - **Systems Engineering and Project Management Strategies for Cost Estimation**
  - **Location:** TBD
This Summer at MIT

Architecting the Future Enterprise
June 8-9, 2009
(25% discount for LAI members)

LAI Lean Academy Course
July 13-15, 2009
(10% discount for LAI members)

LAI Lean Engineering Seminar
July 16-17, 2009
(10% discount for LAI members)

LAI Lean Healthcare Academy
July 16-18, 2009
(10% discount for LAI members)

web.mit.edu/professional/short-programs/
Today....
2009 Annual Meeting: Achieving Enterprise Excellence

Keynote Speaker
Today 9:00 a.m.

“Forging Enterprise Solutions in an Uncertain Era”

LTG Ross Thompson III
Military Deputy
Office of the Assistant Secretary of the Army
for Acquisition, Logistics, and Technology

Baltimore
“Achieving Enterprise Excellence - Imperative in Turbulent Times”

Richard B. Lewis II
LAI Executive Director
and Former COO
Rolls Royce Corporation
2001-2004
2009 Annual Meeting: Achieving Enterprise Excellence

Breakout Session 1
Today 1:30 p.m.

“Enhancing Systems Competencies in the Enterprise”
Session Chair
Dr. Donna Rhodes, LAI

“Merging Lean and Six Sigma for Enterprise Excellence – 1”
Session Chair
Dr. George Roth

“Lean for the Future Workforce”
Session Chair
Prof. Earll Murman

“Supply Chain Management”
Session Chair
Dr. Kirk Bozdogan
2009 Annual Meeting: Achieving Enterprise Excellence

Breakout Session 2
Today 3:45 p.m.

“Global Lean Enterprise Product Development”
Session Chair
Dr. Pedzi Makumbe

“Merging Lean and Six Sigma for Enterprise Excellence – 2”
Session Chair
Dr. George Roth

“Enablers and Measures of Enterprise Effectiveness”
Session Chair
Dr. Ricardo Valerdi

Baltimore
2009 Annual Meeting: Achieving Enterprise Excellence

Tomorrow....
2009 Annual Meeting: Achieving Enterprise Excellence

Lean Healthcare Session
Thursday 8:00 a.m.

“Escalating the Pace of Transformation – Adopting Lean at the New York City Health and Hospitals Corporation”
Joanna Omi,
Senior Assistant Vice President,
New York City Health and Hospitals Corporation

“An Enterprise Systems Approach to Healthcare”
Prof. Debbie Nightingale
MIT, LAI Co-Director

“The LAI-EdNet Journey into Lean Healthcare”
Prof. Earll Murman
MIT, LAI EdNet Director
2009 Annual Meeting: Achieving Enterprise Excellence

Breakout Session 3
Thursday 10:15 a.m.

“Sustaining Lean Practices Through Industry Education Programs”
Session Chair
Dr. Jackie Candido

“Innovation and Lean Thinking in Creating Enterprise Excellence”
Session Chair
Jayakanth “J.K.” Srinivasan

“Portfolio Risk Management”
Session Chair
Chez Vixama
2009 Annual Meeting: Achieving Enterprise Excellence

Lunch and Closing Remarks
Thursday Noon – 2:30 p.m.

“Lessons Learned on Achieving Enterprise Excellence”

John Carroll, Professor, MIT, LAI Co-Director
2009 Annual Meeting: Achieving Enterprise Excellence

Open Discussion
Thursday 2:30 – 4:30 p.m.

“Enterprise Assessment Diagnostics: Lessons Learned from Consortium Members”

Meeting Chair
Tom Shields, LAI