The LAI EdNet
April 2007

32 Member Schools

AFIT
AZ State U
Cal Poly SLO
Cranfield (UK)
DAU
Embry-Riddle
Georgia Tech
Indiana State Univ
Jacksonville Univ
Loyola College, MD
Loyola Marymount
Macon State Col
MIT
Old Dominion Univ
North Carolina State
Purdue Univ
St. Louis Univ, MO
San Jose State Univ
U of AL, Huntsville
U of Iowa
U of Michigan
U MO Rolla
USC
U of Bath (UK)
U of South Florida
U of Tenn, Knoxville
U of New Orleans
U of Louisiana, Lafayette
U of Warwick (UK)
Wichita State Univ
Wright State Univ
WPI

3 UK schools

Plus a 3-person (~1.5 FTE) EdNet Staff to coordinate, develop, and deliver curriculum
Vision: EdNet is a learning community dedicated to creating, deploying, and continuously improving curriculum for enterprise excellence; noticeably impacting workforce capability; and recognized as a model of collaborative innovation.

Mission: EdNet will leverage member’s expertise and resources through collaboration and networking to accelerate the development and deployment of curriculum for achieving enterprise excellence.

Educate, Motivate, Innovate
Curriculum Development Underway

• Tailored LAI Lean Academy® courses:
  • 5 day traditional course
  • 3 day short course
  • 1 day seminars
  • 3+1+1 combo courses

• Develop Lean Engineering/Product Development course

• Develop Lean Supply Chain Management course

Meeting needs with expanded curriculum offerings
LAI EdNet Lean SE Working Group

- SE processes recognized as sound, but not always applied effectively
- “Lean” provides an approach to maximize value while minimizing wasted effort
- Synergies of lean practices and SE practices are being explored

Possible WG outputs
- Lean SE Learning community
- Lean Systems Engineering Framework
- Course materials
- Research
Lean and SE Commonalities

- Lean and Systems Engineering: processes that evolved through experience and practice
  - Shaped by different contexts with different areas of emphasis
  - Bodies of Knowledge (BoKs) based upon observed best practices
- Both emphasize process as a key enabler
- Both have the objective of better delivering best lifecycle value to the customer (end user)
  - Lean: right product at the right time and cost
  - SE: right system that meets customer requirements and works on first use

Can the combination of Lean and SE BoKs lead to a more effective and efficient SE approach?
Is there any evidence based upon actual practice that Lean Thinking and Systems Engineering are synergistic?

Two examples help address this question:

**F/A-18 E/F**

**Iridium Satellite System**
**F/A-18E/F**

**Systems Engineering**
- Rigorous Requirements Flowdown
- Disciplined Technical Reviews
- Configuration / Data Mgt.
- Systems Cost-effectiveness/
- LCC Trade studies
- Producibility / DFMA
- Risk Management / TPM
- Program Independent Audits
- Reliability/ Maintainability/Safety
- Human factors engineering
- Integrated Logistics

**Lean Practices**
- Continuous Improvement
- Optimal First -Unit Delivered Quality
- Metrics Tracked Weekly Across the Extended Enterprise
- Seamless Information Flow (USN, NGC, GE Engines, Suppliers)
- Decisions Made at the Lowest Level of WBS Via “Delegated” RAA
- Joint Configuration Change Board
- Disciplined Weekly Earned Value Mgt. & Reporting

**Achieved Cost, Schedule Performance Goals**

Iridium Execution

Iridium Manufacturing

- Cycle time of 25 days vs. industry standard of 12-18 months
- Dock-to-Dock rate of 4.3 Days

Iridium Deployment

- 72 Satellites in 12 Months, 12 Days
- 14 Satellites on 3 Launch Vehicles, from 3 Countries, in 13 Days
- 22 Consecutive Successful Launches!

Source: Ray Leopold, MIT Minta Martin Lecture, May 2004

© 2007 MIT LAI PD Workshop, Apr 17 9
Lean SE Tool: Draft Model

Meta Principles

Right Job  Job Right

Metrics:

SE Enterprise Principles

Engineering Excellence  Leadership & Organizational Effectiveness  Programmatic Success  Efficient Process Execution

Overarching Practices


Summary

• Lean and Systems Engineering have commonalities
  • Delivering value to customer and end user
  • Focus on process
  • BoKs based upon practice
• There is some evidence that program execution based upon both BoKs perform well
• Are there additional case studies we could learn from?
• Is there interest in codifying the LeanSE BoK?