LESAT: The Lean Enterprise Self Assessment Tool

Professor Deborah Nightingale
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Outline

• LESAT Architecture and Practices
• Assessment Process
• Case Studies Discussion
• Assessment Results
• Transformation Insights
How Do I Assess My Progress?

• Enterprise transformation experience identified need for assessment tool

• Lean Enterprise Self Assessment Tool (LESAT) developed by joint industry / government / MIT team in collaboration with UK LAI

• LESAT supports both
  • “As-Is” Analysis
  AND
  • “To-Be” Vision

• Targeted at Enterprise Leadership Team
What Is LESAT?

Tool for executive self-assessment of the present state of “leanness” of an enterprise and its readiness to change

World Class

Assessment Matrix

Capability maturity model

Supporting materials
LESAT Tool Requirements

• Simple, easy to use by enterprise leadership

• Focus on lean attributes

• Alignment with business performance planning (goals and results)

• Provides guidance for “next steps”
  • Gap analysis capability

• Ability to accommodate both single and aligned organizations (teaming, partnerships, suppliers) within an enterprise
Process Architecture
View of Lean Enterprise

Life Cycle Processes

Enabling Infrastructure Processes

Enterprise Leadership Processes

Source: Lean Aerospace Initiative, MIT © 2001
LESAT Structure is Consistent with Enterprise Architecture

Source: Lean Aerospace Initiative, MIT © 2001
Process Capability Maturity Levels

Level 1
- Some awareness of this practice; sporadic improvement activities may be underway in a few areas.

Level 2
- General awareness; informal approach deployed in a few areas with varying degrees of effectiveness and sustainment.

Level 3
- A systematic approach/methodology deployed in varying stages across most areas; facilitated with metrics; good sustainment.

Level 4
- On-going refinement and continuous improvement across the enterprise; improvement gains are sustained.

Level 5
- Exceptional, well-defined, innovative approach is fully deployed across the extended enterprise (across internal and external value streams); recognized as best practice.

Lean Enterprise Practices

• There are 54 lean enterprise practices in the assessment, divided amongst the three major sections
  • Section 1 Leadership/Transformation (28 practices)
  • Section 2 Lifecycle Processes (18 Practices)
  • Section 3 Enabling Infrastructure (8 Practices)
• Each practice is assessed on a capability maturity scale of 1 to 5
• There is a practice maturity definition for every maturity level in every practice, provided on a maturity matrix assessment sheet
Section I: Lean Transformation/Leadership

- Practices directly linked to enterprise Transition to Lean Model (TTL)
- Assesses the following elements:
  - Strategic integration
  - Leadership and commitment
  - Value stream analysis and balancing
  - Change management
  - Structure and systems
  - Lean transformation planning, execution and monitoring
Enterprise Level Roadmap

Entry/Re-entry Cycle

I.B Adopt Lean Paradigm
Build Vision
Convey Urgency
Foster Lean Learning
Make the Commitment
Obtain Senior Mgmt. Buy-in

I.A Enterprise Strategic Planning
Decision to Pursue Enterprise Transformation

Long Term Cycle

I.C Focus on the Value Stream
Map Value Stream
Internalize Vision
Set Goals & Metrics
Identify & Involve Key Stakeholders

I.D Develop Lean Structure & Behavior
Organize for Lean Implementation
Identify & Empower Change Agents
Align Incentives
Adapt Structure & Systems

Short Term Cycle

I.G Focus on Continuous Improvement
Monitor Lean Progress
Nurture the Process
Refine the Plan
Capture & Adopt New Knowledge

I.F Implement Lean Initiatives
Develop Detailed Plans
Implement Lean Activities

I.E Create & Refine Transformation Plan
Identify & Prioritize Activities
Commit Resources
Provide Education & Training

Enterprise Level Transformation Plan

Environmental Corrective Action Indicators
Detailed Corrective Action Indicators

ESD.61J / 16.852J: Integrating the Lean Enterprise
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LESAT Section I
28 Lean Practices

I.A. Enterprise Strategic Planning
   I.A.1 Integration of Lean in strategic planning process
   I.A.2 Focus on customer value
   I.A.3 Leveraging the extended enterprise

I.B. Adopt Lean Paradigm
   I.B.1 Learning and education in “Lean” for enterprise leaders
   I.B.2 Senior management commitment
   I.B.3 Lean enterprise vision
   I.B.4 A sense of urgency

I.C. Focus on the Value Stream
   I.C.1 Understanding current value stream
   I.C.2 Enterprise flow
   I.C.3 Designing future value stream
   I.C.4 Performance measures

I.D. Develop Lean Structure and Behavior
   I.D.1 Enterprise organizational orientation
   I.D.2 Relationships based on mutual trust
   I.D.3 Open and timely communications
   I.D.4 Employee empowerment
   I.D.5 Incentive alignment
   I.D.6 Innovation encouragement
   I.D.7 Lean change agents

I.E. Create & Refine Transformation Plan
   I.E.1 Enterprise-level Lean transformation plan
   I.E.2 Commit resources for Lean improvements
   I.E.3 Provide education and training

I.F. Implement Lean Initiatives
   I.F.1 Development of detailed plans based on enterprise plan
   I.F.2 Tracking detailed implementation

I.G. Focus on Continuous Improvement
   I.G.1 Structured continuous improvement processes
   I.G.2 Monitoring lean progress
   I.G.3 Nurturing the process
   I.G.4 Capturing lessons learned
   I.G.5 Impacting enterprise strategic planning
I.B.3 Lean Enterprise Vision - new mental model of the enterprise

Level 1: Senior leaders have varying visions of lean, from none to well-defined

Level 2: Senior leaders adopt common vision of lean

Level 3: Lean vision has been communicated and is understood by most employees

Level 4: Common vision of lean is shared by the extended enterprise

Level 5: Stakeholders have internalized the lean vision & are an active part of achieving it

Section II: Life Cycle Processes

Assess:

• Enterprise level core processes
  • Acquisition
  • Program Management
  • Requirements Definition
  • Product/Process Development
  • Supply Chain Management
  • Production
  • Distribution and Support

• Key integrative practices
Life Cycle Processes Support Value Delivery

Generic Product Value Stream

- Acquire Business
- Develop Product
- Produce Product
- Service Product
- Dispose/Update Product

II. A Business Acquisition & Program Management

II. B Requirements Definition

II. C Develop Product and Process

II. D Supply Chain Management

II. E Produce Product

II. F Distribute & Service Product
LESAT Section II
18 Lean Practices

• II.A. Business Acquisition and Program Management
  • II.A.1 Leverage Lean capability for business growth
  • II.A.2 Optimize the capability and utilization of assets
  • II.A.3 Provide capability to manage risk, cost, schedule and performance
  • II.A.4 Allocate resources for program development efforts
• II.B. Requirements Definition
  • II.B.1 Establish a requirements definition process to optimize lifecycle value
  • II.B.2 Utilize data from the extended enterprise to optimize future requirement definitions
• II.C. Develop Product and Process
  • II.C.1 Incorporate customer value into design of products and processes
  • II.C.2 Incorporate downstream stakeholder values into products and processes
  • II.C.3 Integrate product and process development
• II.D. Manage Supply Chain
  • II.D.1 Define and develop supplier network
  • II.D.2 Optimize network-wide performance
  • II.D.3 Foster Innovation and knowledge sharing throughout the supplier network
• II.E. Produce Product
  • II.E.1 Utilize production knowledge and capabilities
  • II.E.2 Establish and maintain a lean production system
• II.F. Distribute and Service Product
  • II.F.1 Align sales and marketing to production
  • II.F.2 Distribute product in a lean fashion
  • II.F.3 Enhance value of delivered products and services to customers and the enterprise
  • II.F.4 Provide post-delivery service, support, and sustainability
LESAT Section II: Example

II.C.2 Incorporate *Downstream Stakeholder Values* (Manufacturing, Support, etc.) into Products & Processes - *Understanding downstream stakeholders allows value to flow seamlessly to customer*

**Level 1**
Manufacturing issues are considered late in design

**Level 2**
Manufacturing & assembly issues are considered earlier in projects, but in an ad hoc manner. Supplier & cost considerations are limited

**Level 3**
Multi-functional teams include some downstream disciplines and key suppliers

**Level 4**
Priorities of downstream stakeholders are quantified as early as possible in design, and used for process evaluation and improvement

**Level 5**
Downstream stakeholders’ values in the extended enterprise are quantified, and balanced via tradeoffs, as a continuous part of the process
LESAT Section III

Section III: Enabling Infrastructure

Assess critical supporting processes
  • Finance
  • Information Technology
  • Human Resources
  • Environmental Health & Safety

8 Lean Practices
  • Lean Organizational Enablers
  • Lean Process Enablers
LESAT Section III: Diagnostic Questions

- Are common tools and systems being used across the enterprise?
- How well have the financial and accounting systems been integrated with non-traditional measures of value creation?
- How well can stakeholders retrieve financial information as required?
- Are human resource practices reviewed to assure intellectual capital matches process needs?
- Are enabling infrastructure processes being aligned to value stream flow?
- Do processes create the least amount of environmental hazards practical?
- Is the information technology system compatible with stakeholder communication and analysis needs?
LESAT Supporting Materials

- Introductory Presentation
- LESAT Matrices & Facilitator’s Guide
- TTL Roadmap & Guide
- Summary Score Calculator
- Glossary of Terms
Outline

• LESAT Architecture and Practices

• Assessment Process

• Case Studies Discussion

• Assessment Results

• Insights
Suggested Methodology for Employing LESAT

Step 1: Facilitated meeting to introduce tool. Enterprise leader champions

Step 2: Enterprise leaders and staff conduct LESAT assessment

Step 3: Leadership reconvenes to jointly determine present maturity level

Step 4: Leadership determines desired level and measures gap

Step 5: Develop action plan and prioritize resources
### Summary Form Example

**LESAT Enterprise Self-Assessment Tool (LESAT)**

#### Section I - Lean Transformation/Leadership

Process Definition: Develop and deploy lean implementation plans throughout the enterprise leading to (1) long-term sustainability, (2) acquiring competitive advantage and (3) satisfaction of stakeholders.

<table>
<thead>
<tr>
<th>TTL Link</th>
<th>Lean Practice</th>
<th>Lean Characteristic</th>
<th>Capability Level</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>I.A. Enterprise Strategic Planning</strong></td>
<td>I.A.1 - Integration of Lean in strategic planning process</td>
<td>Lean impacts growth, profitability and market penetration</td>
<td></td>
</tr>
<tr>
<td></td>
<td>I.A.2 - Focus on customer value</td>
<td>Customers pull value from enterprise value stream</td>
<td></td>
</tr>
<tr>
<td></td>
<td>I.A.3 - Leveraging the extended enterprise</td>
<td>Value stream extends from customer through the enterprise to suppliers</td>
<td></td>
</tr>
<tr>
<td><strong>I.B. Adopt Lean Paradigm</strong></td>
<td>I.B.1 - Learning and education in “Lean” for enterprise leaders</td>
<td>“Unlearning” the old, learning the new</td>
<td></td>
</tr>
<tr>
<td></td>
<td>I.B.2 - Senior management commitment</td>
<td>Senior management leading it personally</td>
<td></td>
</tr>
<tr>
<td></td>
<td>I.B.3 - Lean enterprise vision</td>
<td>New mental model of the enterprise</td>
<td></td>
</tr>
<tr>
<td></td>
<td>I.B.4 - A sense of urgency</td>
<td>The primary driving force for Lean</td>
<td></td>
</tr>
<tr>
<td><strong>I.C. Focus on the Value Stream</strong></td>
<td>I.C.1 - Understanding current value stream</td>
<td>How we now deliver value to customers</td>
<td></td>
</tr>
<tr>
<td></td>
<td>I.C.2 - Enterprise flow</td>
<td>“Single piece flow” of materials and information</td>
<td></td>
</tr>
<tr>
<td></td>
<td>I.C.3 - Designing future value stream</td>
<td>Value stream to meet the enterprise vision</td>
<td></td>
</tr>
<tr>
<td></td>
<td>I.C.4 - Performance measures</td>
<td>Performance measures drive enterprise behavior</td>
<td></td>
</tr>
<tr>
<td><strong>I.D. Develop Lean Structure and Behavior</strong></td>
<td>I.D.1 - Enterprise organizational orientation</td>
<td>Organize to support value delivery</td>
<td></td>
</tr>
<tr>
<td></td>
<td>I.D.2 - Relationships based on mutual trust</td>
<td>“Win-win” vs. “we-they”</td>
<td></td>
</tr>
<tr>
<td></td>
<td>I.D.3 - Open and timely communications</td>
<td>Information exchanged when required</td>
<td></td>
</tr>
<tr>
<td></td>
<td>I.D.4 - Employee empowerment</td>
<td>Decision-making at lowest possible level</td>
<td></td>
</tr>
<tr>
<td></td>
<td>I.D.5 - Incentive alignment</td>
<td>Reward the behavior you want</td>
<td></td>
</tr>
<tr>
<td></td>
<td>I.D.6 - Innovation encouragement</td>
<td>From risk aversion to risk rewarding</td>
<td></td>
</tr>
<tr>
<td></td>
<td>I.D.7 - Lean change agents</td>
<td>The inspiration and drivers of change</td>
<td></td>
</tr>
</tbody>
</table>

*Average*
LESAT Desired Score Can be Tailored for Each Process Area

A Company’s Strategic Plan for a Tailored Capability Goal matched to the business objectives.

LESAT Enterprise Process Areas
Ground Rules

- Perform the assessment from a total enterprise perspective, NOT individual functional area
- Attempt to assess every practice; leave blank if N/A or if you don’t know
- Scoring the practices
  - Each level assumes that lower level criteria are met
  - If between levels, score at the lower level
- Note “evidence” for level selected
- Identify opportunities to increase maturity level
- Seek assistance from company facilitator
SECTION I: LEAN TRANSFORMATION/LEADERSHIP

Definition: Develop, deploy, and manage lean implementation plans throughout the enterprise, leading to: (1) long-term sustainability, (2) acquiring competitive advantage, and (3) satisfaction of stakeholders; along with a continuous improvement in all three parameters.

PROGRAM: Section IA: Lean Transformation / Leadership

Objective
The decision to pursue a lean transformation is strategic in nature. Its impact throughout the enterprise is profound and pervasive, affecting all business practices and processes. The lean enterprise will behave in a fundamentally new manner, significantly eliminating waste and enhancing relationships with all stakeholders.

Lean Roadmap Action Plan

<table>
<thead>
<tr>
<th>A1</th>
<th>Integration of Lean in Strategic Planning Process</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1</td>
<td>Level 2</td>
</tr>
<tr>
<td>Lean impacts growth stability and market penetration</td>
<td></td>
</tr>
<tr>
<td>Lean impacts and benefits of lean principles and practices are not evident in culture or business plan</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>A2</th>
<th>Focus on Customer Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer pull value from enterprise value stream</td>
<td></td>
</tr>
<tr>
<td>Means of defining value to customers (informal &amp; structured)</td>
<td></td>
</tr>
<tr>
<td>Structured pull definition value applied to all customers</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>A3</th>
<th>Leveraging the Extended Enterprise</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value stream extends from customer through the enterprise to suppliers</td>
<td></td>
</tr>
<tr>
<td>Relations with customers and suppliers reflect a “We-They” mentality</td>
<td></td>
</tr>
<tr>
<td>Initial steps identified for establishing enterprise link</td>
<td></td>
</tr>
</tbody>
</table>

Diagnoitic Questions
- Are enterprise leaders aware of the strategic opportunities (i.e., greater growth, profitability, and market penetration) associated with transitioning to a “lean enterprise”?
- Are enterprise leaders familiar with the dramatic increases in competitiveness that many companies have realized as a result of transitioning to lean?
- Has a suitable strategy for growth been identified?
- Has a strategy for growth been defined and documented?
- Is there a defined strategic plan?
- Is there a defined strategic plan that incorporates the results of lean implementation?
- Has a strategy for growth been identified to utilize resources freed up by improvements?
- Has a plan been identified for growth?
- Has a plan been defined and documented?
- Is there an identified plan that incorporates the results of lean implementation?
- Has a plan for growth been defined and documented?

Success Criteria
- Enterprise leaders are aware of the strategic opportunities associated with transitioning to a “lean enterprise”.
- The enterprise is involved in defining and documenting the best methods for contributing to customer success.
- The strategic planning process includes key stakeholder needs from across the enterprise.

Responsibility:

<table>
<thead>
<tr>
<th>Tasks</th>
<th>Major Milestones</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Understand Need for Change</td>
</tr>
<tr>
<td>2</td>
<td>Build Awareness Within Senior Leadership Team</td>
</tr>
<tr>
<td>3</td>
<td>Establish Enterprise Strategy</td>
</tr>
</tbody>
</table>

Impact / Issues (to be completed by responsible person)

Source: Northrop Grumman
Outline

• LESAT Architecture and Practices

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LESAT as a Leading Indicator of Improved Enterprise Value Delivery

State of Enterprise Leanness (LESAT - Leading Indicators)

- Life Cycle Processes (LESAT Sec II)
- Enabling Infrastructure Processes (LESAT Sec III)
- Enterprise Leadership Processes (LESAT Section I)

Enterprise Performance Measures (Lagging Indicators)

- Customer Value
- Financial Value
- Employee Value

Customer focus of Sec II creates Reduced waste in Sec II & III cuts costs and creates Lean in Sec I, II & III creates a more involved and empowered workforce
Leading Indicator Relations in Lean Enterprise Transformation

Life Cycle Processes
(Revenue Generation)

Enabling Infrastructure Processes
(Support LCP’s)

Enterprise Leadership Processes
(Drive Lean Change)

Leads, Enables

Enables

Leads, Enables
Leadership and Lifecycle Processes

Enterprises exhibiting high lean maturity in Leadership/Transformation processes exhibit high lean maturity in Lifecycle processes

Source: Hallam, MIT, 2003

\[ y = 0.9666x + 0.2881 \]
\[ R^2 = 0.6237 \]
Leadership and Enabling Infrastructure

Enterprises exhibiting high lean maturity in Leadership/Transformation processes exhibit high lean maturity in Enabling Infrastructure processes.
Enabling Infrastructure and Lifecycle Processes

Enterprises exhibiting high lean maturity in Enabling Infrastructure processes exhibit high lean maturity in Lifecycle processes.

\[ y = 1.0779x - 0.2044 \]
\[ R^2 = 0.6699 \]

Source: Hallam, MIT, 2003
Observed Categories of Lean Transformation Management

- **Category A - Open Loop Assessment**
  - No feedback to action plan

- **Category B - Independent Closed-Loop Control**
  - Competing improvement plans

- **Category C - Integrated Closed-Loop Control**
  - Integrated strategic improvement plan
Categories of Enterprise Management

\[ y = 0.9666x + 0.2881 \]
\[ R^2 = 0.6237 \]

LSM1 - Leadership/Transformation Average Lean Maturity

LSM2 - Lifecycle Process Average Lean Maturity

Integrated Closed Loop (C)

Dissociated Closed Loop (B)

Open Loop (A)

Source: Hallam, MIT, 2003
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Benefits of LESAT Assessment

- Assessment process as valuable as results
- Increased executive communication
- Creation of common vocabulary
- Identify and support those who need education
- Open identification of enterprise-level issues
- Clear picture of maturity of enterprise
- Next level of maturity obvious
Enterprise Assessment Insights

• LESAT is catalyst to elevate lean to enterprise level

• Differences in perception were disclosed between management layers
  • VP’s: “We’re highly committed!”
  • Directors: “Doesn’t look like it to us!”

• Opportunities for strategic lean actions surface from gap analysis

• The discussion resulting from the assessment analysis proved more valuable than the exact scores

• Many organizations “plateau” without total enterprise view

• A more holistic understanding of the role of leadership, core, and enabling processes in delivering value ensued

• LESAT is complementary to existing assessment tools
Implications for Industry

• Establish senior leadership commitment to begin transformation

• Improve maturity in leadership/transformation practices

• Create formal information feedback mechanisms to
  • prioritize strategically important lean improvement efforts
  • build on lean capabilities
  • build leadership support for continued lean change/operations