Lean Enterprise Self-Assessment Tool (LESAT)
Case Studies for Enterprise Transformation Training

CASE 1 - Advanced Composite Aerostructures Incorporated

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Cases are constructed from data and information obtained while researching U.S. aerospace firms within MIT's Lean Aerospace Initiative consortium. The exact data and corporate information do not in any way reflect a single U.S. aerospace firm that participated in the MIT research. Each case is constructed from data from multiple participants, and appropriately modified in order to demonstrate a particular management issue associated with Lean Enterprise Transformation.

Introduction

Advanced Composite Aerostructures Incorporated (ACAI) is a Virginia-based company with annual revenues of $400 million US dollars. ACAI produces non-primary composite structural components for commercial Aircraft and Spacecraft manufacturers, as well as in-service replacement parts for DOD customers. The company employs 2200 people, has in-house staff for marketing, finance, human resources (HR), product design, engineering, manufacturing, and customer support, and has a base of 225 suppliers. ACAI is very functionally oriented, and is managed by a president and executive committee representing each of the functional groups.

Since 1994, there have been sporadic attempts at becoming lean, mostly due to several shop-floor managers who were intrigued in the concept of lean after attending a conference on Lean Manufacturing. The company achieved several successes in manufacturing between 1994 and 2000 and created several component production lines that were able to produce in single-piece flow, mainly due to cellular reorganization of the production process. The lead-time on these components dropped by 58 percent, and work in progress (WIP) was cut from weeks of inventory to hours of inventory. While these successes were applauded by the director of manufacturing, there has been little change elsewhere in the company to become even leaner. Subsequently, the shop

managers left the company after becoming frustrated by the demands placed on them by financial tracking systems, expediters, MRP systems, warehouse managers, and purchasers that were not allowing the value-delivery process to become even leaner. Faced with the issue of winning new contracts, and hiring new managers who spoke the language of Lean, ACAI's president decided to create a position for VP of Lean who would address the issue of hiring new managers and coordinating the lean production system. After a lengthy search, a suitable candidate, David Stonegarth, was found and hired as the VP of Lean for ACAI.

The new VP was familiar with the work the Massachusetts Institute of Technology's (MIT) Lean Aerospace Initiative (LAI) had been doing on lean transformation. After a lengthy review of ACAI's past efforts David informed the president, Steven Jameson, that the issue of "Enterprise Transformation" was the logical next step for the company as many of the issues identified by the managers who had left the company were related to the whole organization, and not just the manufacturing function. The new VP of Lean proposed that they perform an assessment using MIT's Lean Enterprise Self-Assessment Tool (LESAT) as a means of identifying their strengths and weaknesses with respect to creating a Lean Enterprise at ACAI. The President agreed to this only if the new VP assured him that it would require minimal time from ACAI's executive staff, as he didn't want to burden them with extra paperwork.

LESAT Sessions

David (the new VP of Lean) spent months getting the executives of ACAI to agree to a date where their schedules would all have a mutual availability for a one-hour meeting. Using the briefing material provided by MIT, David gave a 1 hour review of the LESAT tool and provided instructions for the managers to complete the assessment on their own – a task he said would take 1 to 2 hours. He then explained that a follow-up meeting would be held to discuss the results of the assessment.

The ACAI executives left the meeting with their LESAT books in hand and with instructions to get their results to David within three weeks. Over the three weeks, David fielded calls from executives wanting to know what was meant by terminology such as "extended value stream", "enterprise flow", "designing the future value stream", etc. By the end of week three only four of the 12 participants had returned their assessments. David began calling the executives and was faced with common responses such as *"I'm very busy and will get to it when I have a chance."* Finally, after pleading with the president for some support, the executives were forced to complete the assessment and David received all of the data. With some compilation and number crunching in an electronic spreadsheet, David had the assessment results and was ready to organize a post-assessment discussion session for the executives.

LESAT Results

Based on the LESAT assessments done by the 12 participants, David compiled the following LESAT Averages for the X.X-level of the assessment, as presented in Table 1 below. The full list of current-state LESAT results is provided in appendix A.

Section I – Lean Transformation/Leadership	Average = 1.8
I.A Enterprise Strategic Planning	1.7
I.B Adopt Lean Paradigm	1.4
I.C Focus on the Value Stream	1.7
I.D Develop Lean Structure and Behavior	2.4
I.E Create and Refine Transformation Plan	1.7
I.F Implement Lean Initiatives	1.2
I.G Focus on Continuing Improvement	1.5
Section II – Life-Cycle Processes	**Average = 2.3**
II.A Business Acquisition and Program Management	2.2
II.B Requirements Definition	2.3
II.C Develop Product and Process	2.6
II.D Manage Supply Chain	2.0
II.E Produce Product	2.7
II.F Distribute and Service Product	2.4
Section III – Enabling Infrastructure	**Average = 1.9**
III.A Lean Organizational Enablers	1.8
III.B Lean Process Enablers	2.0

Table 1 - Level X.X Average LESAT Rating

With this data in hand, David prepared to present the results to executive management. For the briefing, David first provided a review of the purpose of the LESAT tool, and then reminded the executives of the definitions associated with the 5 levels of the capability maturity model used in the assessment (Appendix B). David presented the general results shown in Table 1 as his high-level summary. As appeared the case, most of the data suggested that there was a general awareness of lean with informal approaches deployed in a few areas with varying degrees of effectiveness and sustainment. Seeing these results, one of the executives commented:

"I have to say that I am quite shocked with how low we scored on this tool, since we have been doing lean for seven years at ACAI. Is this LESAT tool measuring the right aspects of our business, or were we overzealous in extolling the gains achieved by our previous lean improvements in manufacturing? I thought we would have performed much better on this assessment."

David proceeded by discussing the fact that the LESAT tool was aimed at assessing Enterprise-level lean transformation, of which the previous efforts at lean manufacturing were only a small subset. If one considered the items of the assessment related to the manufacturing elements of the enterprise (such as Section II.E.2 in particular), they were scoring significantly higher than the areas such as strategic planning (Section I.A). At this point the director of Engineering, Elizabeth Hartley, spoke up and added:

"David, based on the results you just discussed, I question the validity of this tool. While we scored low in strategic planning on the tool, we all know that each functional manager does strategic planning for his or her functional group for both an annual plan and a 5-year outlook plan. Our functional organizations are definitely better than a 1.7. How can we score low on enterprise strategic planning when everyone in the enterprise's executive management does strategic planning for his or her respective function? "

This point raised several further questions about the tool that were focussed very much on what each functional group was doing. Many of the executives were convinced that their functions should have scored much more highly than the overall average suggested. The discussion then stayed on the issue of functional assessment versus enterprise assessment for quite a while.

At this point in the event the executives were struggling with the many inter-functional issues that began to hit the table in addition to the overall low scores of the LESAT. David suggested that they review the particular line items in the LESAT assessment that scored very low (Appendix A) to frame the discussions and to hopefully help understand why they had arrived at the LESAT results they were faced with. Noting that their scheduled hour was up, the president decided to cast an executive decision:

> *"Folks, there is obviously more to this assessment than meets the eye. We have scored very low on this first assessment, but I am confident that we could do much better the next time around. I suggest that since he is the VP of lean, we task David with working on a plan that will increase all of our scores to a level 3 by the next review period in six months. Then we can set a goal of level 4's and 5's for the next year to make sure we have a world-class ranking. David, we expect to see this plan in the coming weeks."*

The executive committee commended David's effort for organizing the assessment process and concluded the meeting. David returned to his office, sat down at his desk, and contemplated his next steps at ACAI.

Questions for Discussion
1. What is management's apparent understanding of lean?
2. Is ACAI a lean enterprise?
3. What is the data saying? Does it support leadership's view?
4. What does the variability within the scores (Range) indicate?
5. Are the goals set by the president realistic or even achievable?
6. What is right/wrong with management's means of setting goals for becoming a lean enterprise?
7. Are David's next steps clear? What are they?

Appendix A – Current State LESAT Results

SECTION 1 - LEAN TRANSFORMATION/LEADERSHIP				
TTL LINK	**Lean Practice**	**State**	**Mean**	**Range**
I.A Enterprise strategic planning	I.A.1. Integration of lean in strategic planning process	Current	2.0	3
	I.A.2. Focus on customer value	Current	1.7	3
	I.A.3. Leveraging the extended enterprise	Current	1.4	2
I.B Adopt Lean Paradigm	I.B.1. Learning and education in 'lean' for enterprise leaders	Current	1.3	2
	I.B.2. Senior management commitment	Current	1.4	2
	I.B.3 Lean Enterprise Vision	Current	1.5	3
	I.B.4. A sense of urgency	Current	1.3	2
I.C Focus on the Value Stream	I.C.1. Understanding the current value stream	Current	1.4	2
	I.C.2. Enterprise flow	Current	2.0	1
	I.C.3. Designing the future value stream	Current	1.2	1
	I.C.4. Performance measures	Current	2.0	2
I.D Develop lean Structure and Behavior	I.D.1. Enterprise organizational orientation	Current	2.3	2
	I.D.2. Relationships based on mutual trust	Current	2.6	3
	I.D.3. Open and timely communications	Current	2.6	2
	I.D.4. Employee empowerment	Current	2.5	1
	I.D.5. Incentive alignment	Current	2.0	2
	I.D.6. Innovation encouragement	Current	3.0	2
	I.D.7. Lean change agents	Current	1.8	2
I.E Create and Refine Implementation Plan	I.E.1. Enterprise level lean implementation plan	Current	1.2	3
	I.E.2. Commit resources for lean improvements	Current	2.0	1
	I.E.3. Provide education and training	Current	2.0	2
I.F Implement Lean Initiatives	I.F.1. Development of detailed plans based on enterprise plan	Current	1.2	1
	I.F.2. Tracking detailed implementation	Current	1.2	2
I.G Focus on Continuous Improvement	I.G.1. Structured continuous improvement process	Current	1.1	2
	I.G.2. Monitoring lean progress	Current	1.2	2
	I.G.3. Nurturing the process	Current	1.9	1
	I.G.4. Capturing lessons learned	Current	1.6	2
	I.G.5. Impacting enterprise strategic planning	Current	1.8	2

SECTION II - LIFE CYCLE PROCESSES				
	Lean Practice	**State**	**Mean**	**Range**
II.A. Business Acquisition and Program Management	II.A.1. Leverage lean capability for business growth	Current	1.3	2
	II.A.2. Optimize the capability and utilization of assets	Current	1.3	1
	II.A.3. Provide capability to manage risk, cost, schedule and performance	Current	3.0	2
	II.A.4. Resource and empower program development efforts	Current	3.2	2
II. B. Requirements Definition	II.B.1. Establish a requirements definition process to optimize lifecycle value	Current	2.1	2
	II.B.2. Utilize data from the extended enterprise to optimize future requirement definitions	Current	2.4	1
II.C. Develop Product and Process	II.C.1. Incorporate customer value into design of products and processes	Current	2.8	2
	II.C.2. Incorporate downstream stakeholder values into products and processes	Current	2.8	2
	II.C.3. Integrate product and process development	Current	2.2	1
II.D. Supply Chain Management	II.D.1. Define and develop supplier network	Current	1.9	1
	II.D.2. Optimize network-wide performance	Current	2.0	2
	II.D.3. Foster innovation and knowledge-sharing throughout the supplier network	Current	2.0	1
II.E. Produce Product	II.E.1. Utilize production knowledge and capabilities for competitive advantage	Current	2.0	1
	II.E.2. Establish and maintain a lean production system	Current	3.4	2
II.F. Distribute and Service Product	II.F.1. Align sales and marketing to production	Current	2.2	3
	II.F.2. Distribute product in lean fashion	Current	2.5	1
	II.F.3. Enhance value of delivered products and services to customers and the enterprise	Current	2.5	1
	II.F.4. Provide post delivery service, support and sustainability	Current	1.7	2

SECTION III - ENABLING INFRASTRUCTURE				
	Lean Practice	**State**	**Mean**	**Range**
III.A. Lean Organizational Enablers	III.A.1. Financial system supports lean transformation	Current	1.1	2
	III.A.2. Enterprise stakeholders pull required financial information	Current	1.6	3
	III.A.3. Promulgate the learning organization	Current	1.5	2
	III.A.4. Enable the lean enterprise with information systems and tools	Current	1.8	3
	III.A.5. Integration of environmental protection, heath and safety into the business	Current	3.1	2
III.B. Lean Process Enablers	III.B.1. Process standardization	Current	2.0	2
	III.B.2. Common tools and systems	Current	2.0	1
	III.B.3. Variation reduction	Current	2.0	2

Appendix B – Generic Capability Maturity Levels

Capability Maturity Level	Generic Definition
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.