Lean Aerospace Initiative

LESAT

The Lean Enterprise Self Assessment Tool

November 11, 2002

Professor Debbie Nightingale

Research Sponsored By LAI

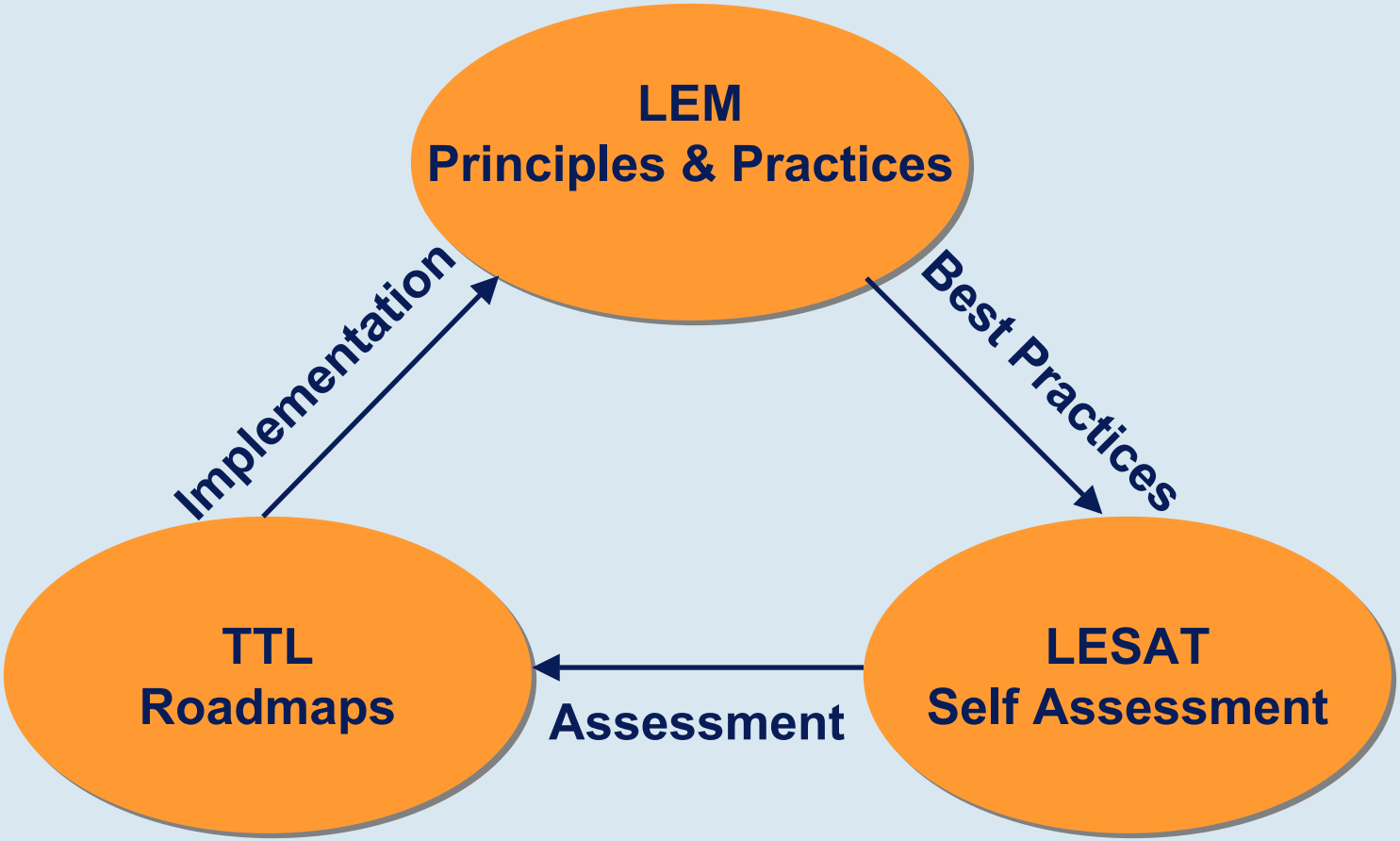
Lean Aerospace Initiative

Overview

- Background
- LESAT Development Process
- LESAT Architecture and Practices
- Assessment Process
- LESAT Research Results

Lean Aerospace Initiative

LAI Enterprise Tool Triad



Lean Aerospace Initiative

Lean Enterprise Model

Practices and Benchmark Data

Meta-Principles/Enterprise Principles

Enterprise Level Metrics

Overarching Practices

Identify & Optimize Enterprise Flow	Assure Seamless Information Flow	Optimize Capability & Utilization of People	Make Decisions at Lowest Possible Level
Implement Integrated Product & Process Development	Develop Relationships Based on Mutual Trust & Commitment	Continuously Focus on the Customer	Promote Lean Leadership at all Levels
Maintain Challenge of Existing Processes	Nurture a Learning Environment	Ensure Process Capability and Maturation	Maximize Stability in a Changing Environment

Metrics - Barriers - Interactions

Data Sheets (~225)

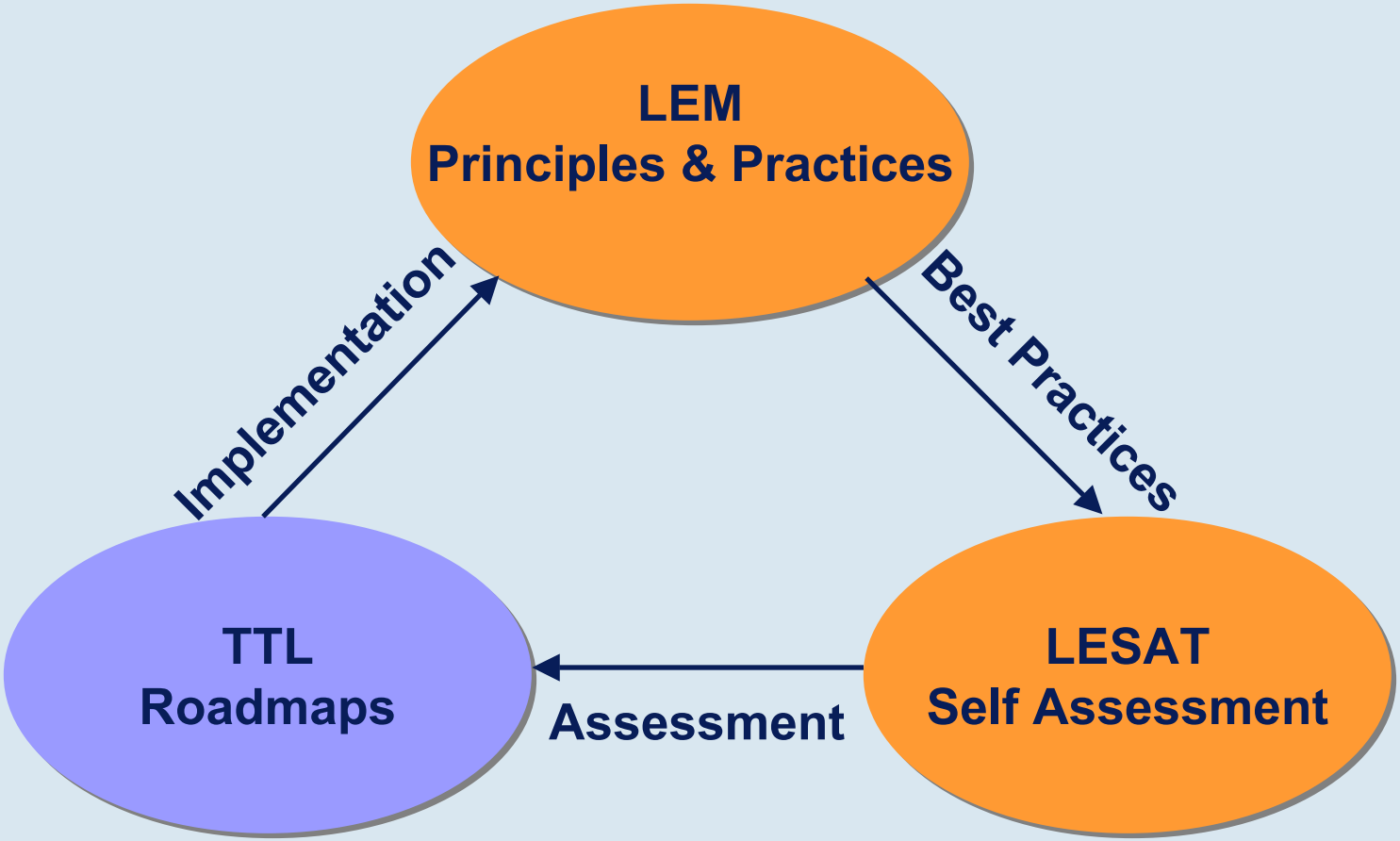
Enabling Practices (~ 60)
Metrics -Data - Barriers - Interactions

Supporting Practices(~300)

Internet Links (~600)

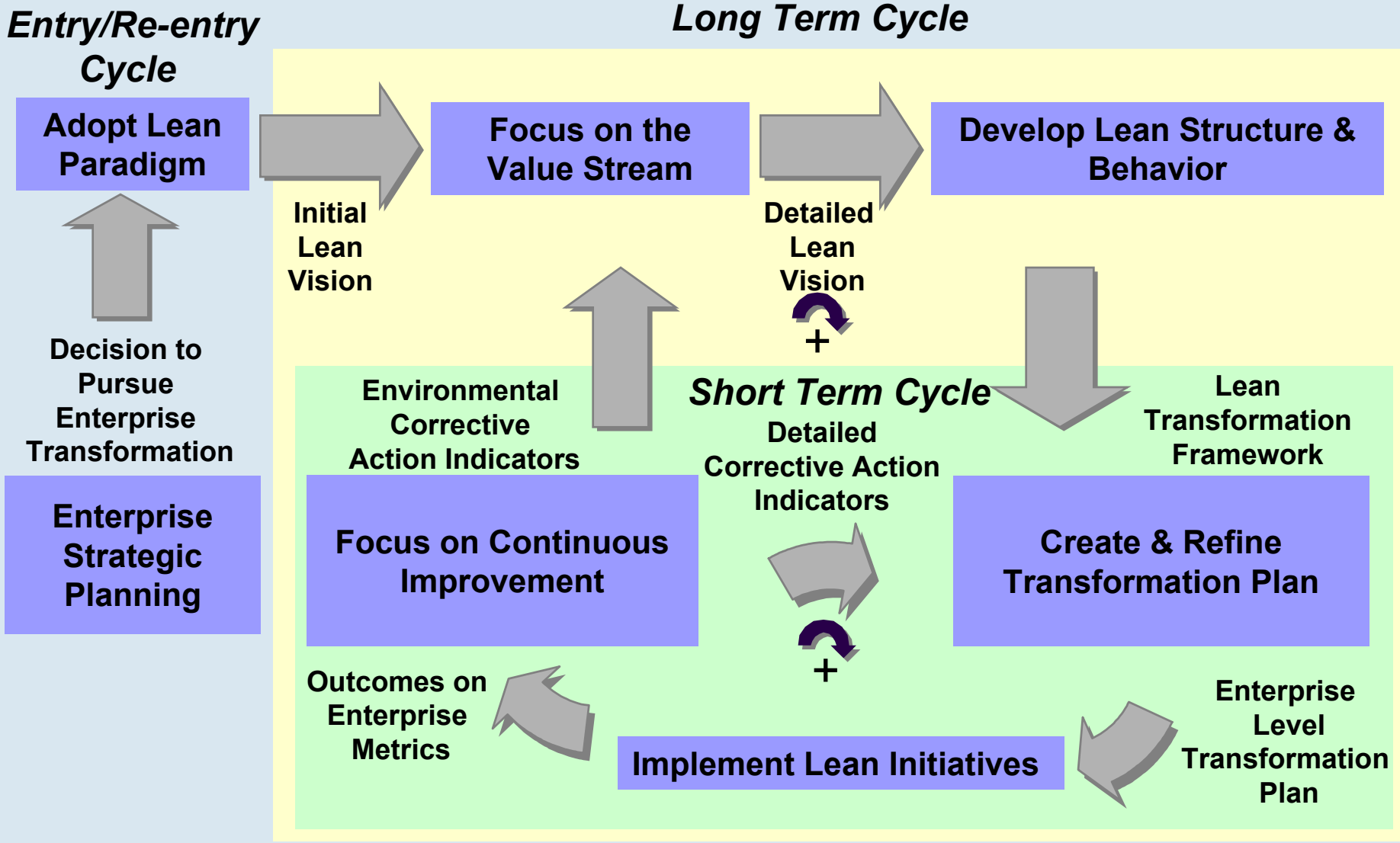
Lean Aerospace Initiative

LAI Enterprise Tool Triad



Lean Aerospace Initiative

Enterprise Transition To Lean (TTL) Roadmap



Lean Aerospace Initiative

Enterprise Level Roadmap

Entry/Re-entry Cycle

Adopt Lean Paradigm

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

Decision to Pursue Enterprise Transformation

Enterprise Strategic Planning

Long Term Cycle

Initial Lean Vision

Focus on the Value Stream

- Map Value Stream
- Internalize Vision
- Set Goals & Metrics
- Identify & Involve Key Stakeholders

Detailed Lean Vision

Develop Lean Structure & Behavior

- Organize for Lean Implementation
- Identify & Empower Change Agents
- Align Incentives
- Adapt Structure & Systems

+

Short Term Cycle

Environmental Corrective Action Indicators

Lean Transformation Framework

Focus on Continuous Improvement

- Monitor Lean Progress
- Nurture the Process
- Refine the Plan
- Capture & Adopt New Knowledge

Detailed Corrective Action Indicators

Create & Refine Transformation Plan

- Identify & Prioritize Activities
- Commit Resources
- Provide Education & Training

+

Outcomes on Enterprise Metrics

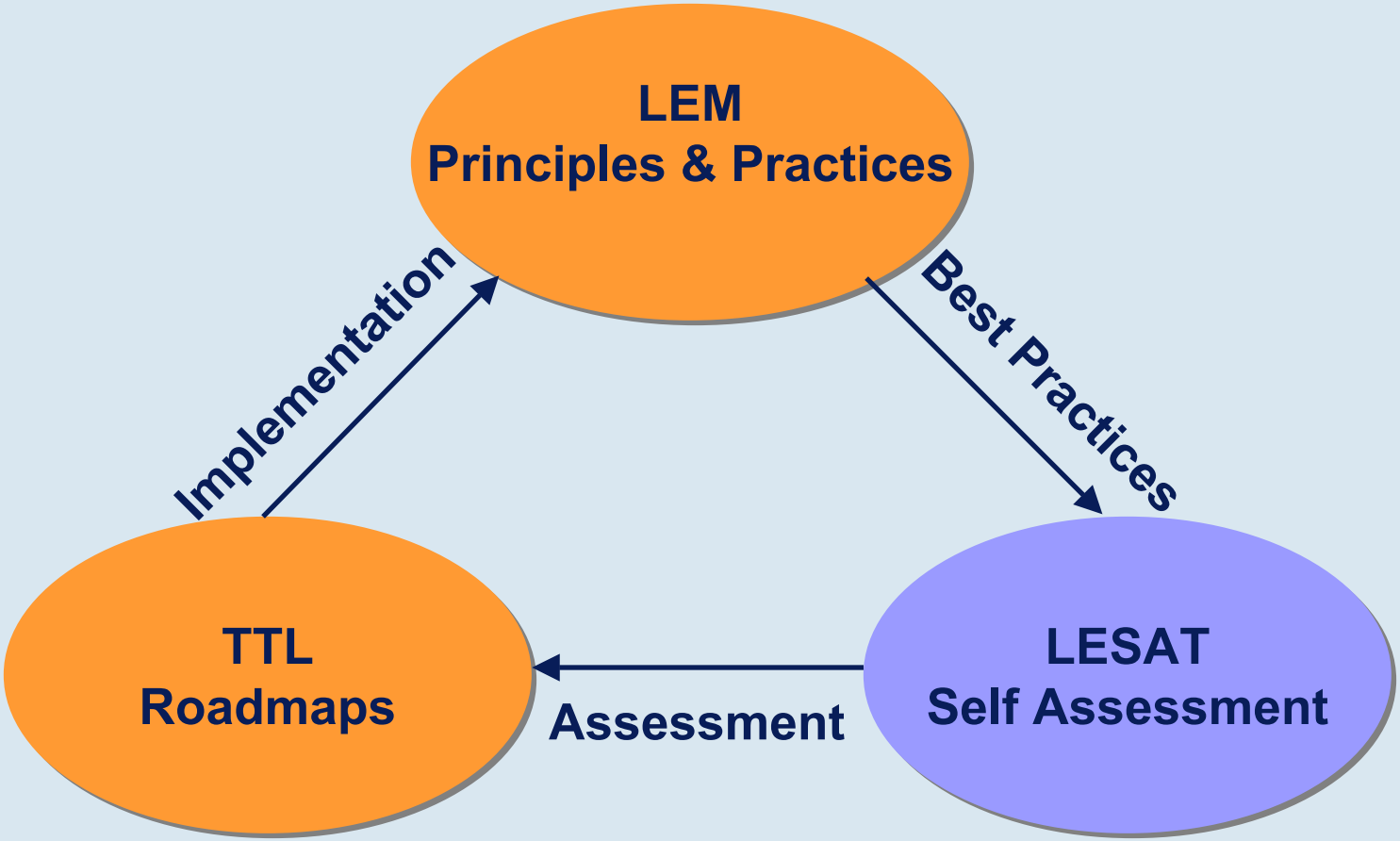
Implement Lean Initiatives

- Develop Detailed Plans
- Implement Lean Activities

Enterprise Level Transformation Plan

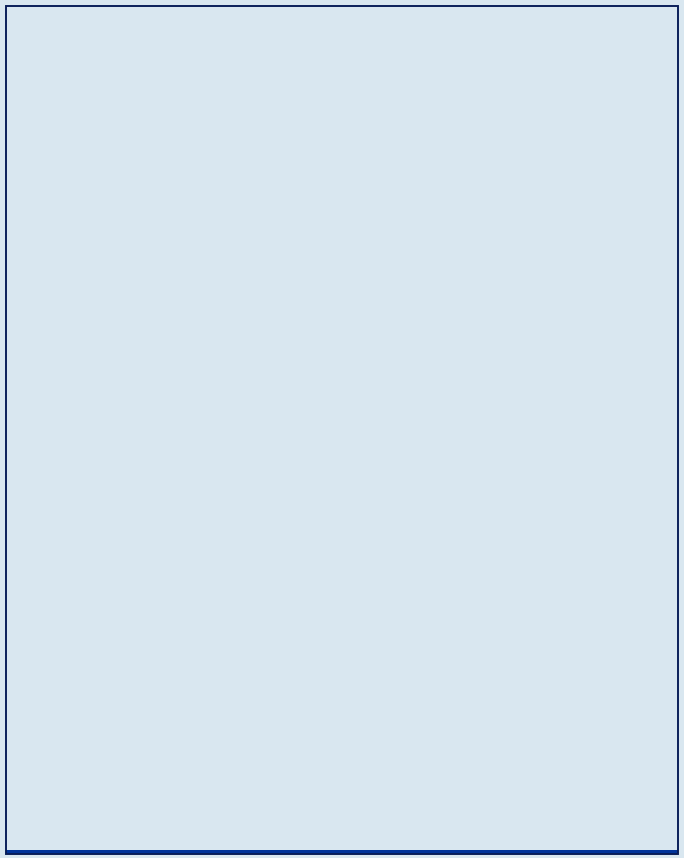
Lean Aerospace Initiative

LAI Enterprise Tool Triad



Lean Aerospace Initiative

What Is LESAT?



- A tool for self-assessing the present state of "leanness" of an enterprise and its readiness to change
- Comprised of:
  - Capability maturity model for enterprise leadership, life cycle and enabling processes
  - Supporting materials: (Facilitator's Guide, Glossary, etc.)

Source: Lean Aerospace Initiative, MIT © 2001

Lean Aerospace Initiative

How Do I Assess My Progress?

- Enterprise TTL application highlighted 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

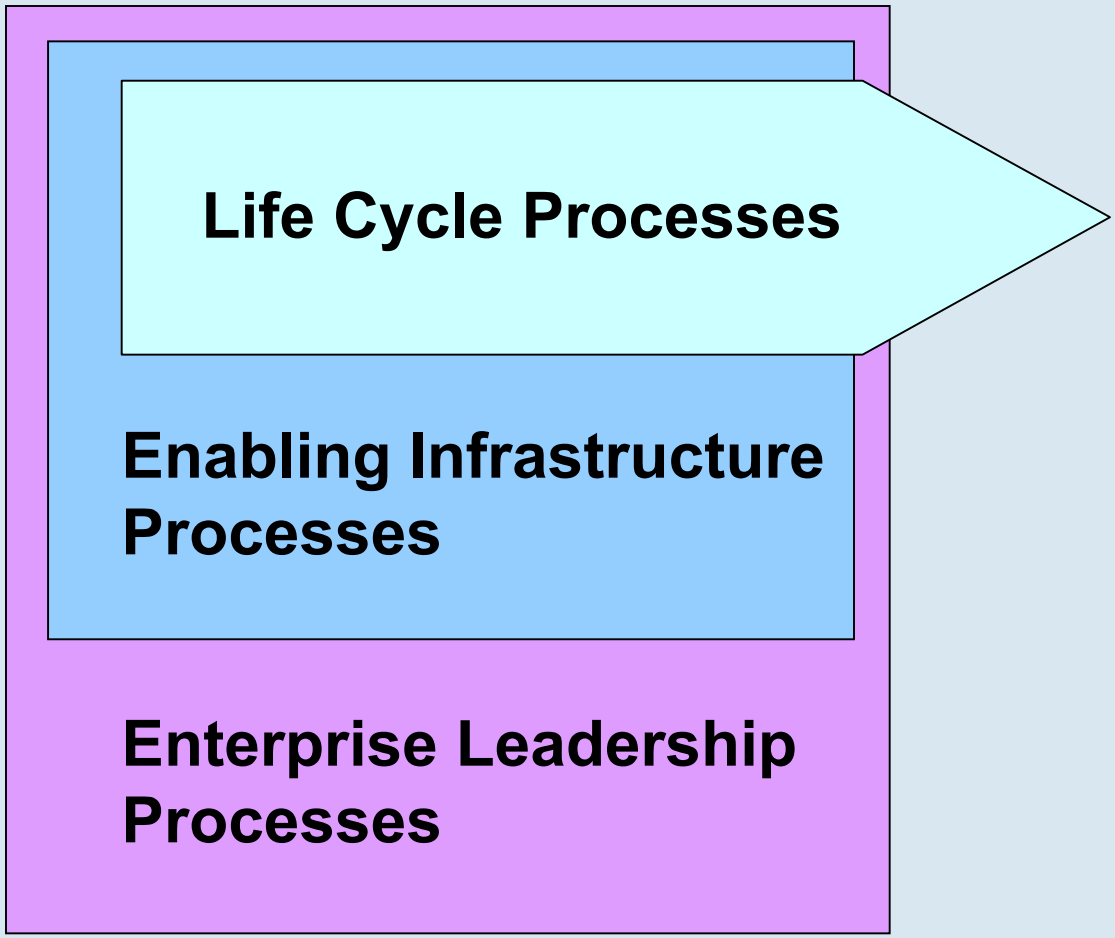
Lean Aerospace Initiative

LESAT Tool Requirements
(Survey of LAI Stakeholders)

- 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

Lean Aerospace Initiative

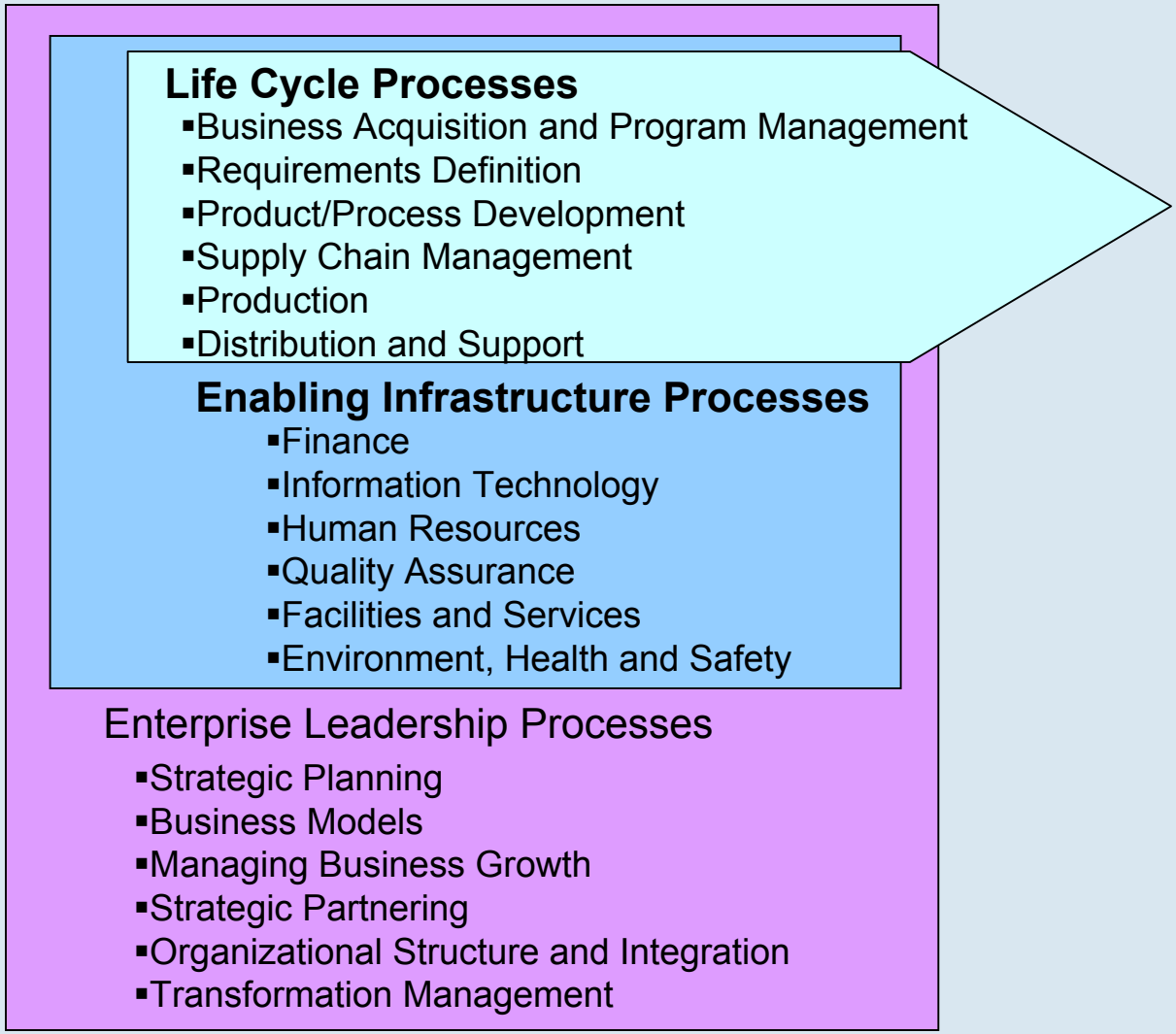
Process Architecture View of Lean Enterprise



Source: Lean Aerospace Initiative, MIT © 2001

Lean Aerospace Initiative

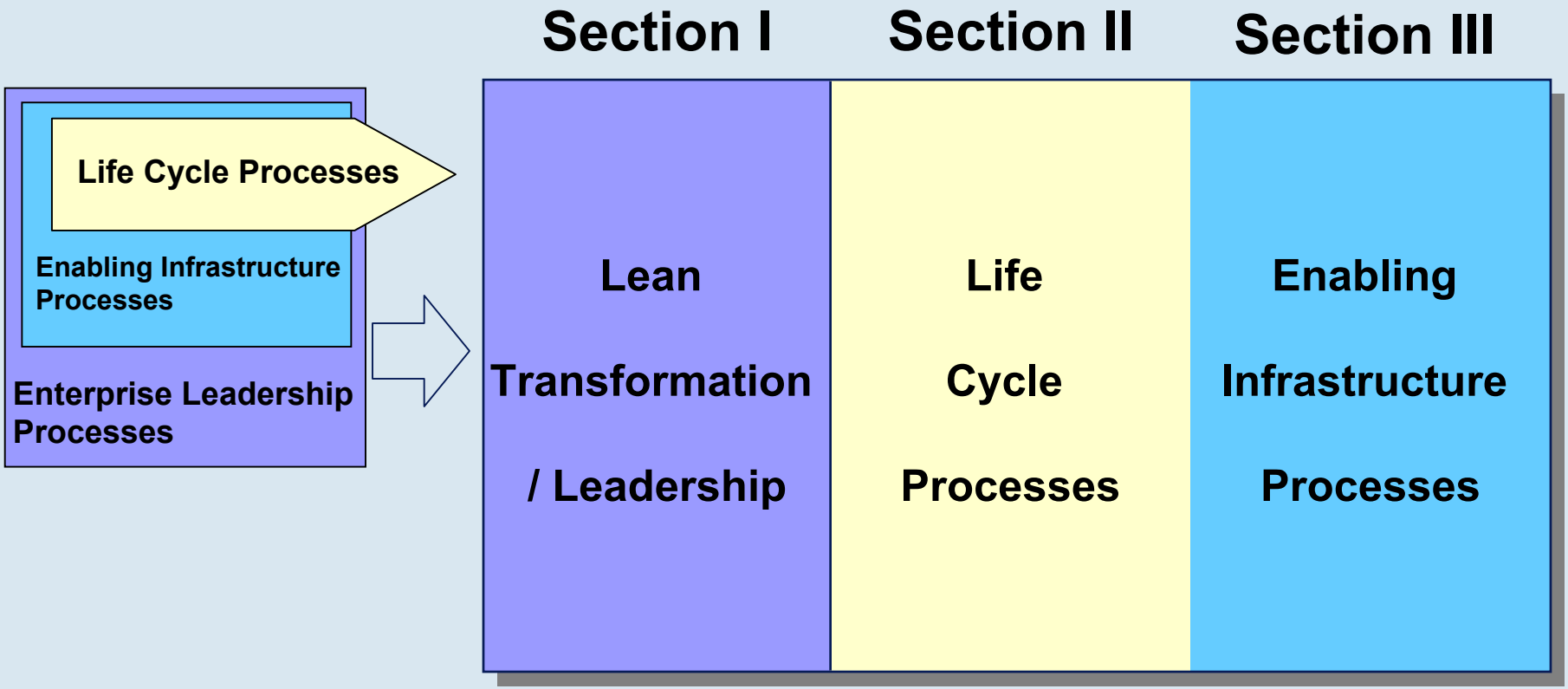
Lean Enterprise Process Architecture



Source: Lean Aerospace Initiative, MIT © 2001

Lean Aerospace Initiative

LESAT Structure is Consistent with Enterprise Architecture



Source: Lean Aerospace Initiative, MIT © 2001

Lean Aerospace Initiative

LESAT Maturity Matrix Template

Section, Group # and Group Name: Brief description of this Group number. In Section I, the Group is one of the Primary Activities from the Transition-to-Lean (TTL) Roadmap

Diagnostic Questions	1.0 Generic questions regarding the performance of the enterprise relative to this Group of practices

LP#	Lean Practices	Capability Levels				
		Level 1	***Level 2***	***Level 3***	***Level 4***	***Level 5***
	A specific lean practice associated with this Group **Sound bit phrase**	Statement describing little awareness of this lean practice C D	C D	C D	C D	Statement describing world-class behavior for this lean practice C D
	Lean Indicators	Outcomes and lean behaviors that an enterprise will exhibit as it proceeds on its Lean transformation				
	Evidence	Supporting data utilized in assessing the current capability level of the Enterprise on this lean practice				
	Opportunities	Inputs to plans of action to leverage opportunities or to move to the desired level of capability				

Source: U.S. and U.K. Lean Aerospace Initiative, © 2001

Lean Aerospace Initiative

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.

Source: U.S. and U.K. Lean Aerospace Initiative, © 2001

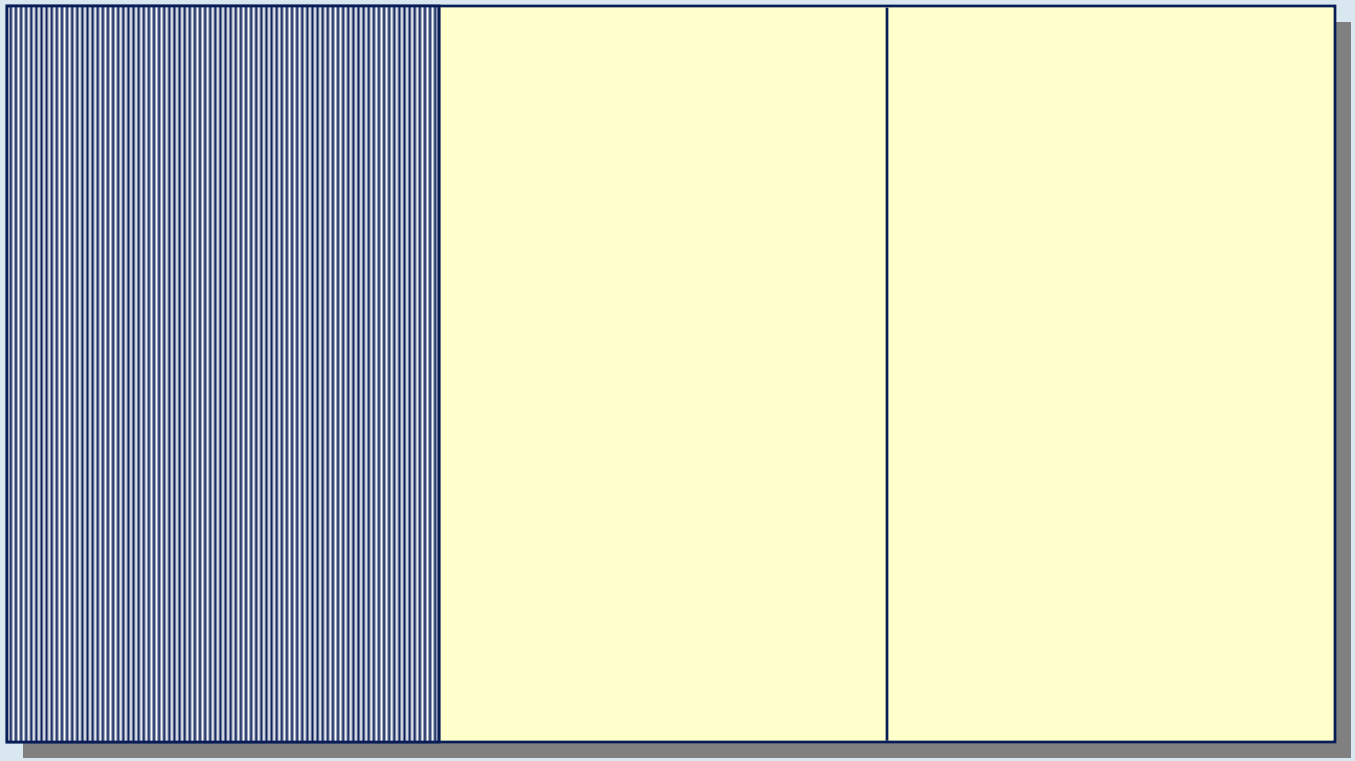
Lean Aerospace Initiative

LESAT Architecture

Section I
Lean Transformation / Leadership

Section II
Life Cycle Processes

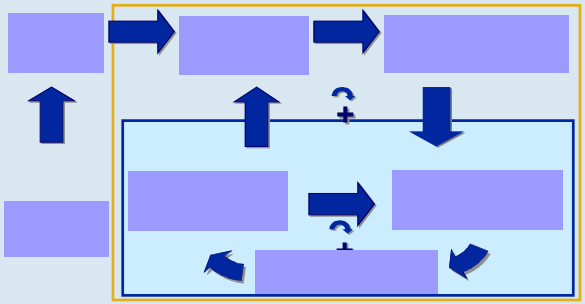
Section III
Enabling Infrastructure Processes



LESAT Section I

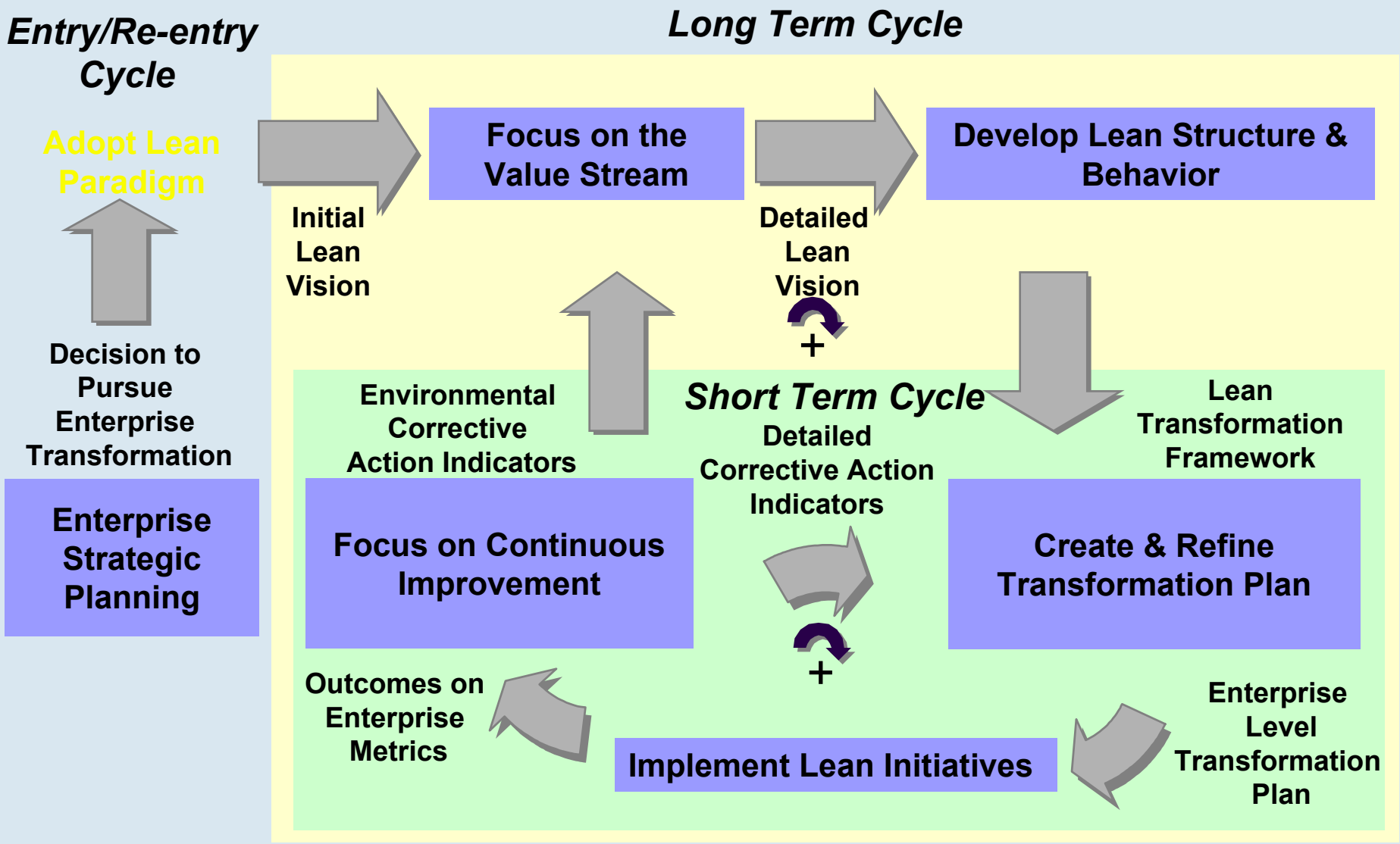
Section I: Lean Transformation/Leadership

- 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



Lean Aerospace Initiative

Enterprise Transition To Lean (TTL) Roadmap



Lean Aerospace Initiative

I.B. Adopt Lean Paradigm

I.B. Adopt Lean Paradigm - Transitioning to lean requires a significant modification to the business model of the enterprise. It is imperative that the enterprise leadership understands and buys into the lean paradigm since they will be required to create a vision for doing business, behaving and seeing value in fundamentally different ways.

Diagnostic Questions

1. Do enterprise leaders and senior managers understand the lean paradigm at the enterprise level?
2. Do all senior leaders and management enthusiastically support a transformation to lean?
3. Has a common vision of lean been communicated throughout the enterprise and within the extended enterprise?
4. Has a compelling case been developed for the Lean transformation?

LP#	Lean Practices	Capability Levels				
		Level 1	***Level 2***	***Level 3***	***Level 4***	***Level 5***
I.B.3.	**Lean Enterprise Vision** *New mental model of the enterprise*	Senior leaders have varying vision of lean, from none to well-defined. C D	Senior leaders adopt common vision of lean. C D	Lean vision has been communicated and is understood by most employees. C D	Common vision of lean is shared by the extended enterprise. C D	Stakeholders have internalized the lean vision and are an active part of achieving it. C D
	Lean Indicators	➢The role that lean plays in achieving the vision is clearly defined ➢The vision has been communicated to all levels and has extensive buy-in by most employees. ➢The vision incorporates a new mental model of how the company would act and behave according to lean principles and practices				
	Evidence					
	Opportunities					

 Source: U.S. and U.K. Lean Aerospace Initiative, © 2001

Lean Aerospace Initiative

I.B. Adopt Lean Paradigm

I.B. Adopt Lean Paradigm - Transitioning to lean requires a significant modification to the business model of the enterprise. It is imperative that the enterprise leadership understands and buys into the lean paradigm since they will be required to create a vision for doing business, behaving and seeing value in fundamentally different ways.

Diagnostic Questions

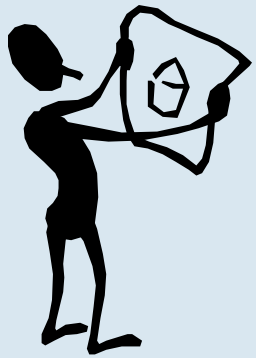
1. Do enterprise leaders and senior managers understand the lean paradigm at the enterprise level?
2. Do all senior leaders and management enthusiastically support a transformation to lean?
3. Has a common vision of lean been communicated throughout the enterprise and within the extended enterprise?
4. Has a compelling case been developed for the Lean transformation?

LP#	Lean Practices	Capability Levels				
		Level 1	***Level 2***	***Level 3***	***Level 4***	***Level 5***
I.B.3.	**Lean Enterprise Vision** *New mental model of the enterprise*	Senior leaders have varying vision of lean, from none to well-defined. C D	Senior leaders adopt common vision of lean. C D	Lean vision has been communicated and is understood by most employees. C D	Common vision of lean is shared by the extended enterprise. C D	Stakeholders have internalized the lean vision and are an active part of achieving it. C D
	Lean Indicators	➢The role that lean plays in achieving the vision is clearly defined ➢The vision has been communicated to all levels and has extensive buy-in by most employees. ➢The vision incorporates a new mental model of how the company would act and behave according to lean principles and practices				
	Evidence					
	Opportunities					

Source: U.S. and U.K. Lean Aerospace Initiative, © 2001

I.B. Diagnostic Questions

- Do enterprise leader and senior managers understand the lean paradigm at the enterprise level?
- Have all senior managers made a commitment to enthusiastically support a transformation to lean?
- Has a common vision of lean been communicated throughout the enterprise and within the extended enterprise?
- Has a compelling case been developed for the lean transformation?



Lean Aerospace Initiative

I.B. Adopt Lean Paradigm

I.B. Adopt Lean Paradigm - Transitioning to lean requires a significant modification to the business model of the enterprise. It is imperative that the enterprise leadership understands and buys into the lean paradigm since they will be required to create a vision for doing business, behaving and seeing value in fundamentally different ways.

Diagnostic Questions

1. Do enterprise leaders and senior managers understand the lean paradigm at the enterprise level?
2. Do all senior leaders and management enthusiastically support a transformation to lean?
3. Has a common vision of lean been communicated throughout the enterprise and within the extended enterprise?
4. Has a compelling case been developed for the Lean transformation?

LP#	Lean Practices	Capability Levels				
		Level 1	***Level 2***	***Level 3***	***Level 4***	***Level 5***
I.B.3.	**Lean Enterprise Vision** *New mental model of the enterprise*	Senior leaders have varying vision of lean, from none to well-defined. C D	Senior leaders adopt common vision of lean. C D	Lean vision has been communicated and is understood by most employees. C D	Common vision of lean is shared by the extended enterprise. C D	Stakeholders have internalized the lean vision and are an active part of achieving it. C D
	Lean Indicators	➢The role that lean plays in achieving the vision is clearly defined ➢The vision has been communicated to all levels and has extensive buy-in by most employees. ➢The vision incorporates a new mental model of how the company would act and behave according to lean principles and practices				
	Evidence					
	Opportunities					

Source: U.S. and U.K. Lean Aerospace Initiative, © 2001

Lean Aerospace Initiative

LESAT Section I: Example

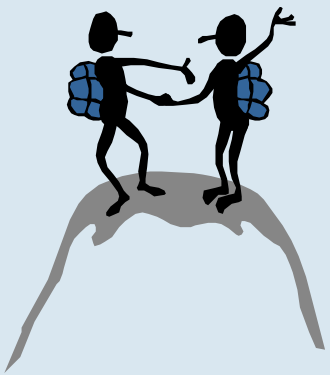
I.B.3 Lean Enterprise Vision - new mental model of the enterprise

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

  Source: U.S. and U.K. Lean Aerospace Initiative, © 2001

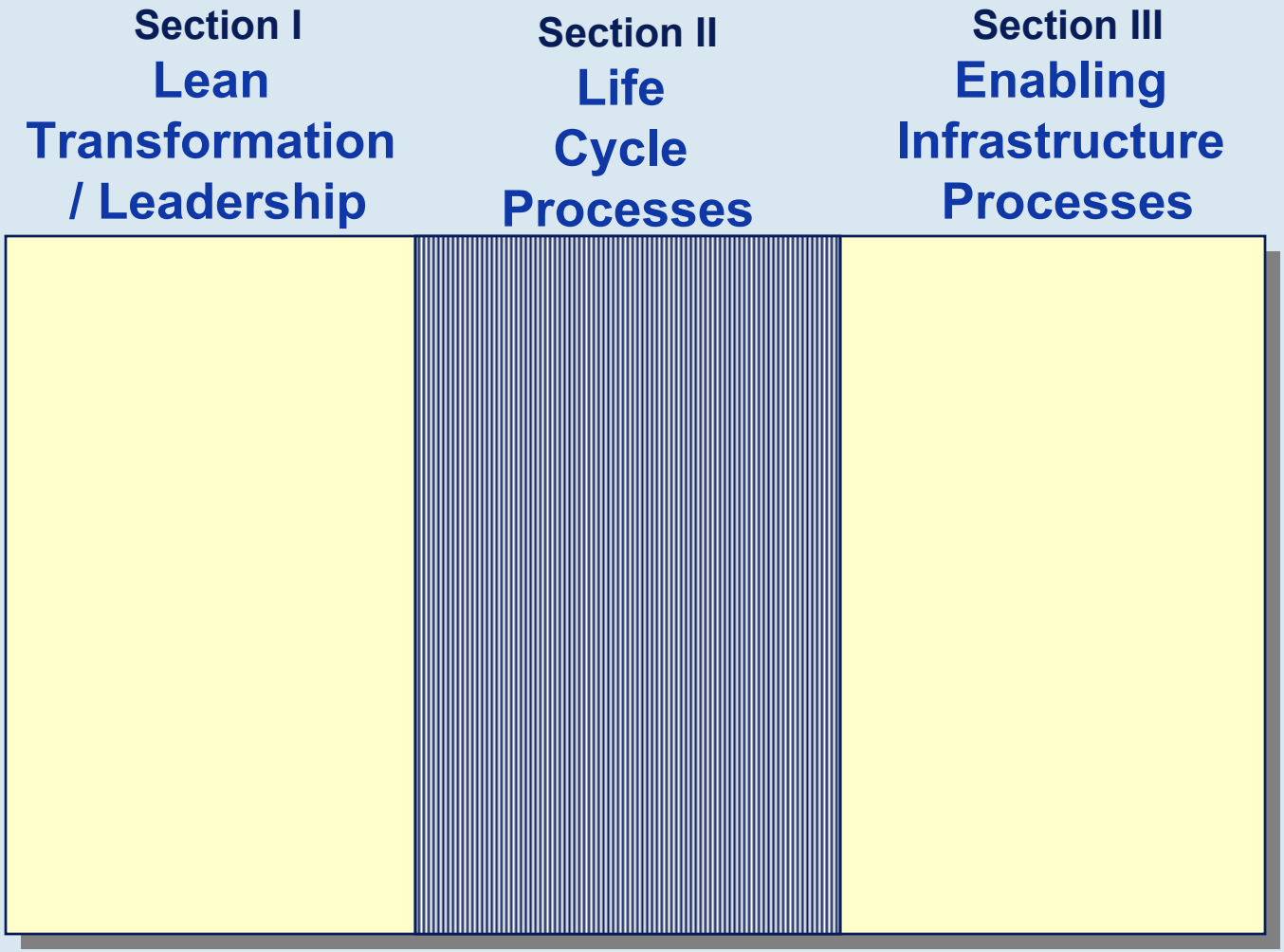
Lean Indicators

- The role that lean plays in achieving the vision is clearly defined
- The vision has been communicated to all levels and has extensive buy-in by most employees
- The vision incorporates a new mental model of how the company would act and behave according to lean principles and practices



Lean Aerospace Initiative

LESAT Architecture



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

Lean Aerospace Initiative

II.C. Develop Product and Process

II. C. Develop Product and Process - Product and process design decisions must be based upon value quantifications and tradeoffs that incorporate inputs from affected stakeholders.

Diagnostic Questions

- Is the product development process formalized and understood?
- Are customers and other lifecycle stakeholders regularly involved in product and process development?
- Are downstream stakeholder issues in design and development considered and incorporated as early as possible in the process?
- Have most of the unnecessary iterations in the development cycle been removed?
- Has the development cycle been simplified and aligned to the critical path?
- Are products and processes being developed concurrently?

LP#	Lean Practices	Capability Levels				
		Level 1	***Level 2***	***Level 3***	***Level 4***	***Level 5***
II.C.2	**Incorporate Downstream *Stakeholder Values* (Manufacturing, Support, etc.) into Products and Processes** *Understanding downstream stakeholders allows value to flow seamlessly to customer*	Manufacturing issues are considered late in design. C D	Manufacturing and assembly issues are considered earlier in projects, but in ad hoc manner. Supplier and cost considerations are limited. C D	Multi-functional teams include some downstream disciplines and key suppliers. C D	Priorities of downstream stakeholders are quantified as early as possible in design, and used for process evaluation and improvement. C D	Downstream stakeholders' values in the extended enterprise are quantified and balanced via tradeoffs, as a continuous part of the process. C D
	Lean Indicators (Examples)	➢There is early consideration and incorporation of downstream stakeholders issues throughout design development ➢The scope of considerations integrated into designs has been extended to include manufacturing, assembly, serviceability and cost implications ➢Products are easier to produce and have lower life-cycle costs				
	Evidence					
	Opportunities					

Source: U.S. and U.K. Lean Aerospace Initiative, © 2001

Lean Aerospace Initiative

II.C. Develop Product and Process

II. C. Develop Product and Process - Product and process design decisions must be based upon value quantifications and tradeoffs that incorporate inputs from affected stakeholders.

Diagnostic Questions

- Is the product development process formalized and understood?
- Are customers and other lifecycle stakeholders regularly involved in product and process development?
- Are downstream stakeholder issues in design and development considered and incorporated as early as possible in the process?
- Have most of the unnecessary iterations in the development cycle been removed?
- Has the development cycle been simplified and aligned to the critical path?
- Are products and processes being developed concurrently?

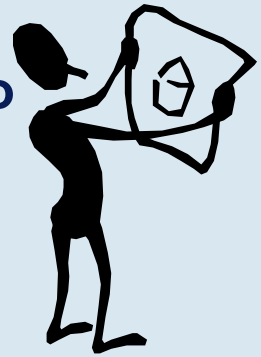
LP#	Lean Practices	Capability Levels				
		Level 1	***Level 2***	***Level 3***	***Level 4***	***Level 5***
II.C.2	**Incorporate Downstream *Stakeholder Values* (Manufacturing, Support, etc.) into Products and Processes** *Understanding downstream stakeholders allows value to flow seamlessly to customer*	Manufacturing issues are considered late in design. C D	Manufacturing and assembly issues are considered earlier in projects, but in ad hoc manner. Supplier and cost considerations are limited. C D	Multi-functional teams include some downstream disciplines and key suppliers. C D	Priorities of downstream stakeholders are quantified as early as possible in design, and used for process evaluation and improvement. C D	Downstream stakeholders' values in the extended enterprise are quantified and balanced via tradeoffs, as a continuous part of the process. C D
	Lean Indicators (Examples)	➢There is early consideration and incorporation of downstream stakeholders issues throughout design development ➢The scope of considerations integrated into designs has been extended to include manufacturing, assembly, serviceability and cost implications ➢Products are easier to produce and have lower life-cycle costs				
	Evidence					
	Opportunities					

Source: U.S. and U.K. Lean Aerospace Initiative, © 2001

Lean Aerospace Initiative

Diagnostic Questions

- Is the product development process formalized and understood?
- Are customers and other lifecycle stakeholders regularly involved in product and process development?
- Are downstream stakeholder issues in design and development considered and incorporated as early as possible in the process?
- Have most of the unnecessary iterations in the development cycle been removed?
- Has the development cycle been simplified and aligned to the critical path?
- Are products and processes being developed concurrently?



Lean Aerospace Initiative

II.C. Develop Product and Process

II. C. Develop Product and Process - Product and process design decisions must be based upon value quantifications and tradeoffs that incorporate inputs from affected stakeholders.

Diagnostic Questions

- Is the product development process formalized and understood?
- Are customers and other lifecycle stakeholders regularly involved in product and process development?
- Are downstream stakeholder issues in design and development considered and incorporated as early as possible in the process?
- Have most of the unnecessary iterations in the development cycle been removed?
- Has the development cycle been simplified and aligned to the critical path?
- Are products and processes being developed concurrently?

LP#	Lean Practices	Capability Levels				
		Level 1	***Level 2***	***Level 3***	***Level 4***	***Level 5***
II.C.2	**Incorporate Downstream *Stakeholder Values* (Manufacturing, Support, etc.) into Products and Processes** *Understanding downstream stakeholders allows value to flow seamlessly to customer*	Manufacturing issues are considered late in design. C D	Manufacturing and assembly issues are considered earlier in projects, but in ad hoc manner. Supplier and cost considerations are limited. C D	Multi-functional teams include some downstream disciplines and key suppliers. C D	Priorities of downstream stakeholders are quantified as early as possible in design, and used for process evaluation and improvement. C D	Downstream stakeholders' values in the extended enterprise are quantified and balanced via tradeoffs, as a continuous part of the process. C D
	Lean Indicators (Examples)	➢There is early consideration and incorporation of downstream stakeholders issues throughout design development ➢The scope of considerations integrated into designs has been extended to include manufacturing, assembly, serviceability and cost implications ➢Products are easier to produce and have lower life-cycle costs				
	Evidence					
	Opportunities					

Source: U.S. and U.K. Lean Aerospace Initiative, © 2001

Lean Aerospace Initiative

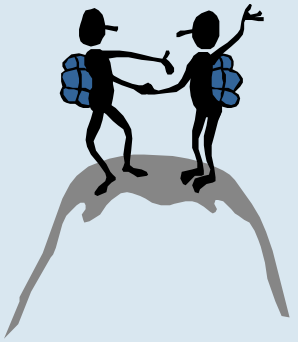
Enterprise Level Section II: Example

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

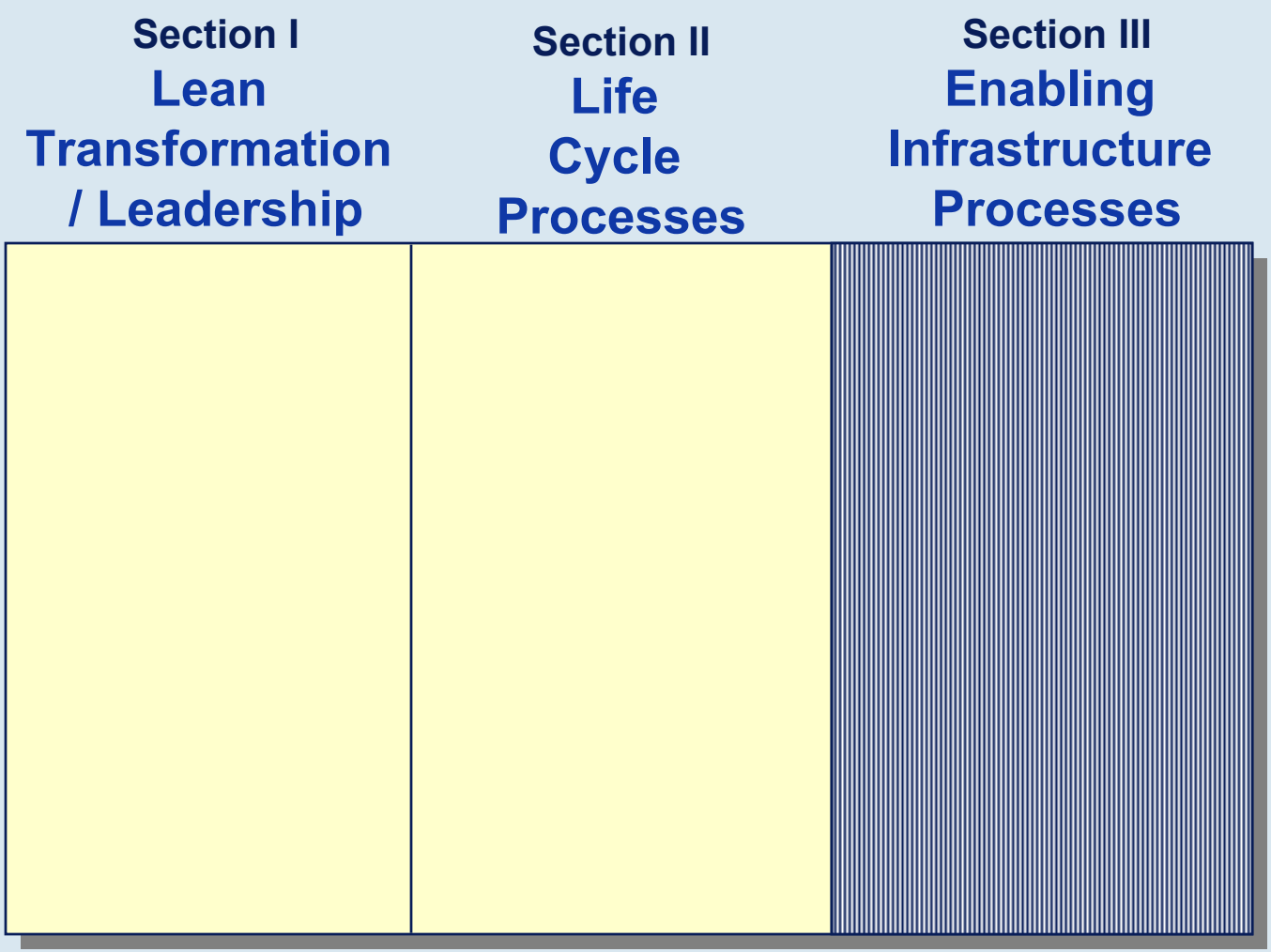
Lean Indicators

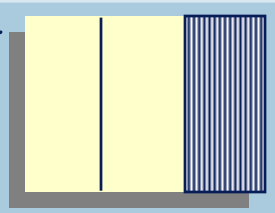
- There is early consideration and incorporation of downstream stakeholder issues throughout design development
- The scope of considerations integrated into designs has been extended to include manufacturing, assembly, serviceability and cost considerations
- Products are easier to produce and have lower life-cycle costs



Lean Aerospace Initiative

LESAT Architecture





LESAT Section III

Section III: Enabling Infrastructure

Lean Organizational Enablers

- Finance
- Information Technology
- Human Resources
- Environmental Health & Safety

Lean Process Enablers

- Standardized processes
- Common tools and systems
- Variation reduction

Lean Aerospace Initiative

III.A. Lean Organizational Enablers

III.A. Lean Organization Enablers - The support units of an enterprise infrastructure must support the implementation of lean principles, practices and behavior.

Diagnostic Questions

- Do the finance and accounting measures support the implementation of lean?
- How well have the financial and accounting systems been integrated with non-financial measures of value creation?
- Can stakeholders retrieve financial information as required?
- Are human resource practices reviewed to assure that intellectual capital matches process needs?
- Are the information technology systems compatible with stakeholder communications and analysis needs?
- Do processes created the least amount of environmental hazards practical?

LP#	Lean Practices	Capability Levels				
		Level 1	*Level 2*	*Level 3*	*Level 4*	*Level 5*
III.A.1	**Financial System Supports Lean Transformation** *Lean requires appropriate financial data*	Finance system provides basic balance sheet and cost accounting data; there is little awareness and exploration of broader support roles for finance. C D	Initial efforts are underway to adapt or modify systems to compensate for the inadequacies of the formal financial system. C D	Finance system is overhauled to provide data and financial information to support and enable a lean transformation at any level. C D	Financial system scope is expanded to integrate with non-traditional measures of value creation (e.g., intellectual capital, balanced scorecard, etc.). C D	Financial systems provide seamless information exchange across the extended enterprise, with emphasis on value creation for all stakeholders. C D
	Lean Indicators	➢Financial measures that conflict with lean activity are no longer used to measure progress and performance. ➢The financial system handles a balanced set of financial and non-financial measures to assist decision-making. ➢The financial system has been overhauled to ensure fast and efficient processing of information as required.				
	Evidence					
	Opportunities					

Source: U.S. and U.K. Lean Aerospace Initiative, © 2001

Lean Aerospace Initiative

III.A. Lean Organizational Enablers

III.A. Lean Organization Enablers - The support units of an enterprise infrastructure must support the implementation of lean principles, practices and behavior.

Diagnostic Questions	
	. Do the finance and accounting measures support the implementation of lean?
	. How well have the financial and accounting systems been integrated with non-financial measures of value creation?
	. Can stakeholders retrieve financial information as required?
	. Are human resource practices reviewed to assure that intellectual capital matches process needs?
	. Are the information technology systems compatible with stakeholder communications and analysis needs?
	. Do processes created the least amount of environmental hazards practical?

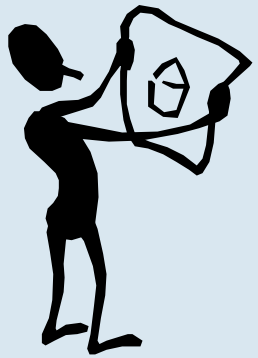
LP#	Lean Practices	Capability Levels				
		Level 1	***Level 2***	***Level 3***	***Level 4***	***Level 5***
III.A.1	**Financial System Supports Lean Transformation** *Lean requires appropriate financial data*	Finance system provides basic balance sheet and cost accounting data; there is little awareness and exploration of broader support roles for finance. C D	Initial efforts are underway to adapt or modify systems to compensate for the inadequacies of the formal financial system. C D	Finance system is overhauled to provide data and financial information to support and enable a lean transformation at any level. C D	Financial system scope is expanded to integrate with non-traditional measures of value creation (e.g., intellectual capital, balanced scorecard, etc.). C D	Financial systems provide seamless information exchange across the extended enterprise, with emphasis on value creation for all stakeholders. C D
	Lean Indicators	➢Financial measures that conflict with lean activity are no longer used to measure progress and performance. ➢The financial system handles a balanced set of financial and non-financial measures to assist decision-making. ➢The financial system has been overhauled to ensure fast and efficient processing of information as required.				
	Evidence					
	Opportunities					

Source: U.S. and U.K. Lean Aerospace Initiative, © 2001

Lean Aerospace Initiative

Section III. Diagnostic Questions

- Do the finance and accounting measures support the implementation of lean?
- How well have the financial and accounting systems been integrated with non-financial measures of value creation?
- Can stakeholders retrieve financial information as required?
- Are human resource practices reviewed to assure that intellectual capital matches process needs?
- Are the information technology systems compatible with stakeholder communications and analysis needs?
- Do processes create the least amount of environmental hazards practical?



Lean Aerospace Initiative

III.A. Lean Organizational Enablers

III.A. Lean Organization Enablers - The support units of an enterprise infrastructure must support the implementation of lean principles, practices and behavior.

Diagnostic Questions

- Do the finance and accounting measures support the implementation of lean?
- How well have the financial and accounting systems been integrated with non-financial measures of value creation?
- Can stakeholders retrieve financial information as required?
- Are human resource practices reviewed to assure that intellectual capital matches process needs?
- Are the information technology systems compatible with stakeholder communications and analysis needs?
- Do processes created the least amount of environmental hazards practical?

LP#	Lean Practices	Capability Levels				
		Level 1	*Level 2*	*Level 3*	*Level 4*	*Level 5*
III.A.1	**Financial System Supports Lean Transformation** *Lean requires appropriate financial data*	Finance system provides basic balance sheet and cost accounting data; there is little awareness and exploration of broader support roles for finance. C D	Initial efforts are underway to adapt or modify systems to compensate for the inadequacies of the formal financial system. C D	Finance system is overhauled to provide data and financial information to support and enable a lean transformation at any level. C D	Financial system scope is expanded to integrate with non-traditional measures of value creation (e.g., intellectual capital, balanced scorecard, etc.). C D	Financial systems provide seamless information exchange across the extended enterprise, with emphasis on value creation for all stakeholders. C D
	Lean Indicators	➢Financial measures that conflict with lean activity are no longer used to measure progress and performance. ➢The financial system handles a balanced set of financial and non-financial measures to assist decision-making. ➢The financial system has been overhauled to ensure fast and efficient processing of information as required.				
	Evidence					
	Opportunities					

Source: U.S. and U.K. Lean Aerospace Initiative, © 2001

Enterprise Level Section III: Example

III.A.1 Financial system supports lean transformation -

Lean requires accurate assessment of value stream activities

Level 1	Finance system provides basic balance sheet and cost accounting data; there is little awareness and exploration of broader support roles for finance.
Level 2	Initial efforts are underway to adapt or modify systems to compensate for the inadequacies of the formal financial system.
Level 3	Finance system is overhauled to provide data and financial information to support and enable a lean transformation at any level.
Level 4	Financial system scope is expanded to integrate with non-traditional measures of value creation (e.g., intellectual capital, balanced scorecard, etc.).
Level 5	Financial systems provide seamless information exchange across the extended enterprise, with emphasis on value creation for all stakeholders.

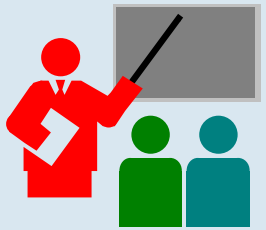
Lean Aerospace Initiative

Lean Indicators

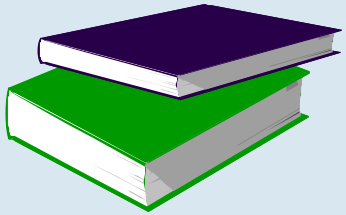
- Financial measures that conflict with lean activity are no longer used to measure progress and performance.
- The financial system handles a balanced set of financial and non-financial measures to assist decision-making.
- The financial system has been overhauled to ensure fast and efficient processing of information as required.
- Financial and performance measurement data can be accessed as needed in user-defined format.
- Financial information can be extrapolated to forecast outcomes.
- System provides up to date information on request and rationalizes information no longer used.

Lean Aerospace Initiative

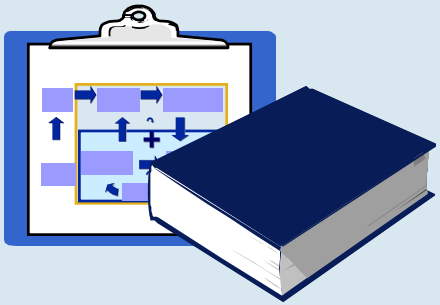
LESAT Supporting Materials



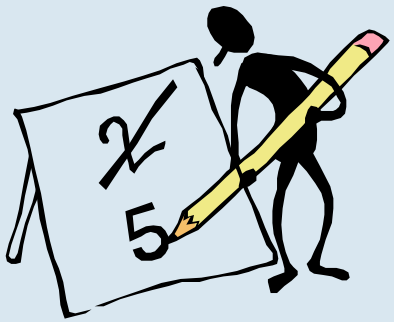
- Introductory Presentation



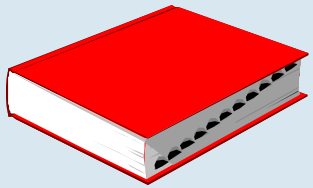
- LESAT Matrices & Facilitator's Guide



- TTL Roadmap & Guide



- Summary Score Calculator



- Glossary of Terms

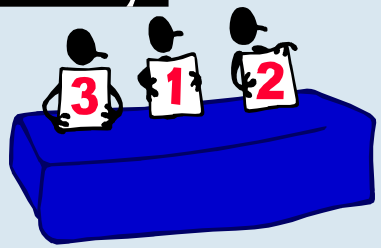
Lean Aerospace Initiative

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

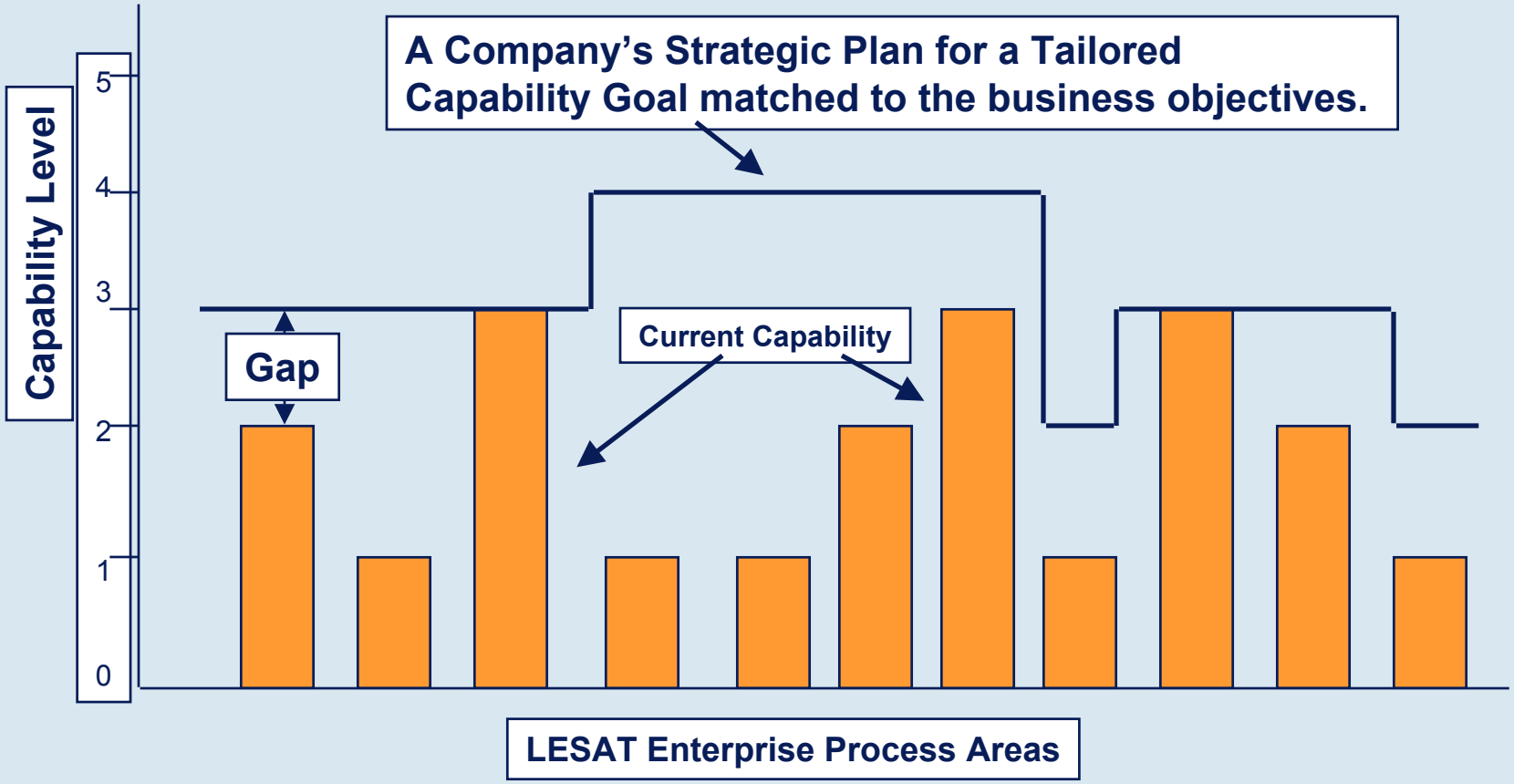
Lean Aerospace Initiative

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

Lean Aerospace Initiative

LESAT Desired Score Can be Tailored for Each Process Area



Lean Aerospace Initiative

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

Lean Aerospace Initiative

Schedule

LESAT Overview/Kickoff	Today 
Completed assessments to site coordinator	TBD _____
Scores compiled and summarized	TBD _____
Consolidation/Feedback Session	TBD _____

Lean Aerospace Initiative

LESAT Observations and Insights

- Opportunities for strategic lean improvement actions surfaced from the assessment
- Significant progress in manufacturing or supply chain integration, but are just beginning to address other enterprise processes
- Differences in perception were disclosed between management layers
  - VP's: "We're highly committed!"
  - Director's: "Doesn't look like it to us!"
- Lean progress sometimes "plateaued" due to low maturity in Section I (Leadership) and Section III (Enabling Infrastructure)

Lean Aerospace Initiative

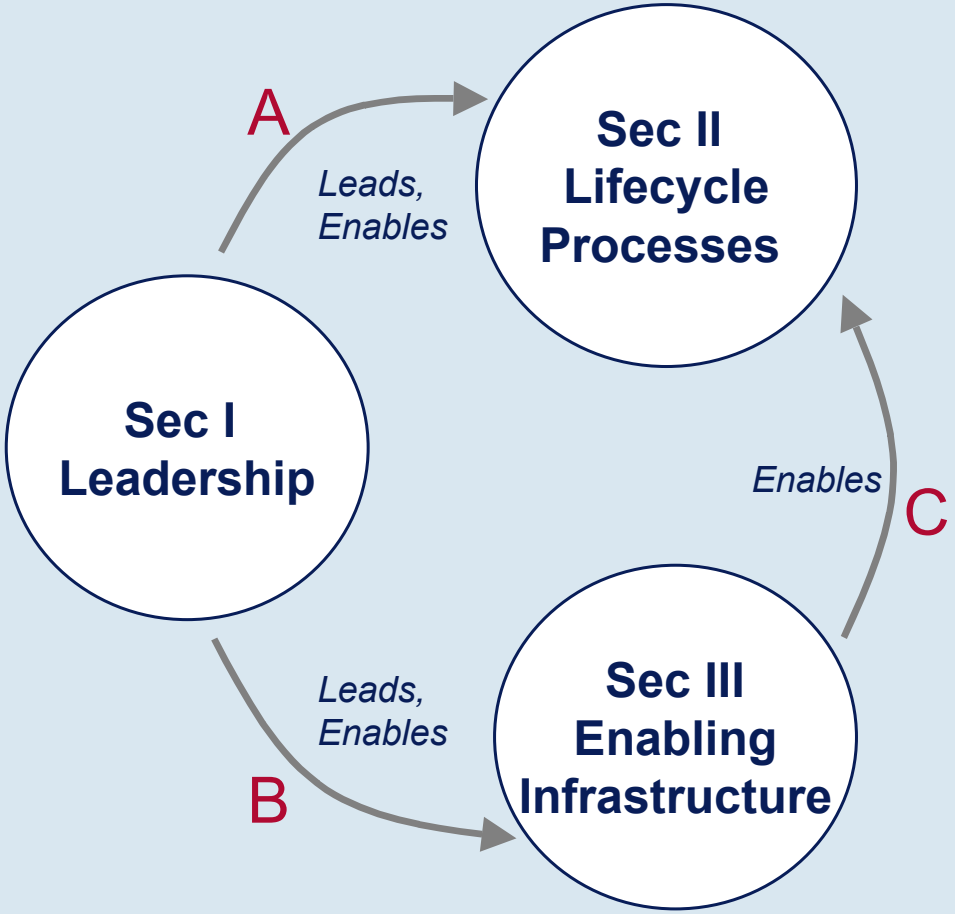
LESAT Observations and Insights

- Senior executive leadership, commitment, and involvement are critical success factors in enterprise transformation
- Variability in scores across enterprise were revealing indicator of executive team communication
- Post-assessment discussion of significant value (more than actual scores!)
- The transformation is continuous and takes years, not months
- A more holistic understanding of the role of leadership, core, and enabling processes in delivering value almost always ensued

Relationship Among LESAT Sections

State of Enterprise Leanness

(Leading Indicators)

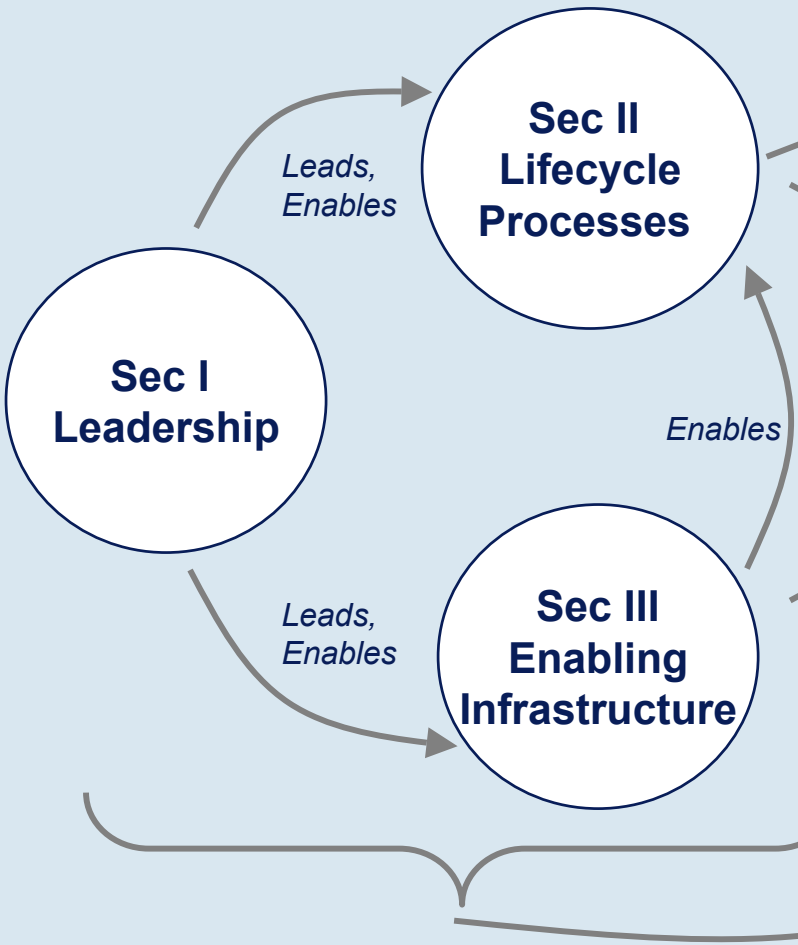


Lean Aerospace Initiative

Research Hypotheses

State of Enterprise Leanness
(Leading Indicators)

Enterprise Performance Measures
(Lagging Indicators)



Customer focus of Sec II creates

Customer Value
- Customer Satisfaction Measure
- Quality
- Cost
- Time

Reduced waste in Sec II & III cuts costs and creates

Financial Value
- Labor productivity
- Capital productivity
- Investment productivity
- (All as ratio to industry average)

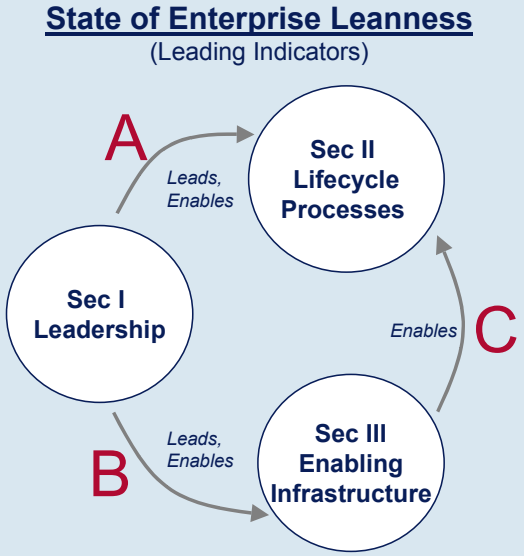
Lean in Sec I, II & III creates a more involved and empowered workforce

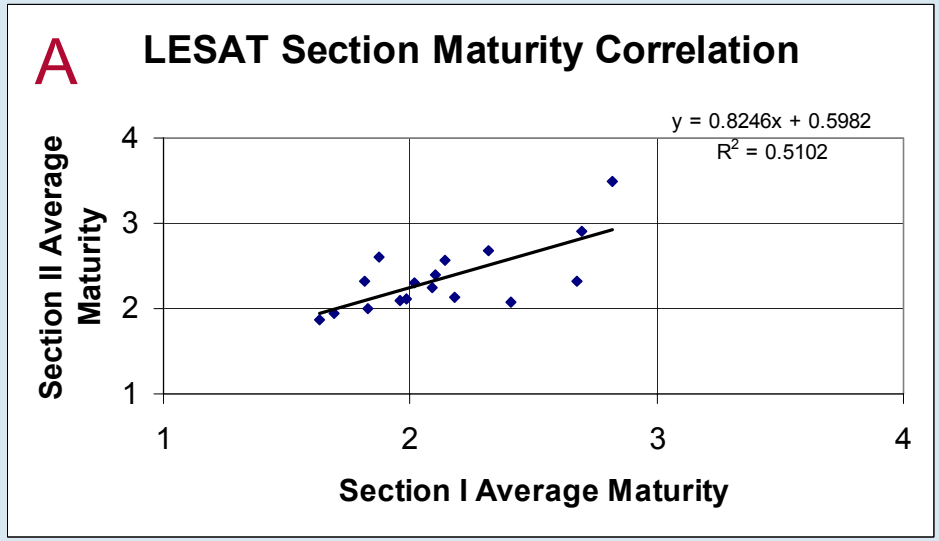
Employee Value
- Enjoyment of Job
- Feeling of Empowerment
- Opinions valued
- Open and clear communications

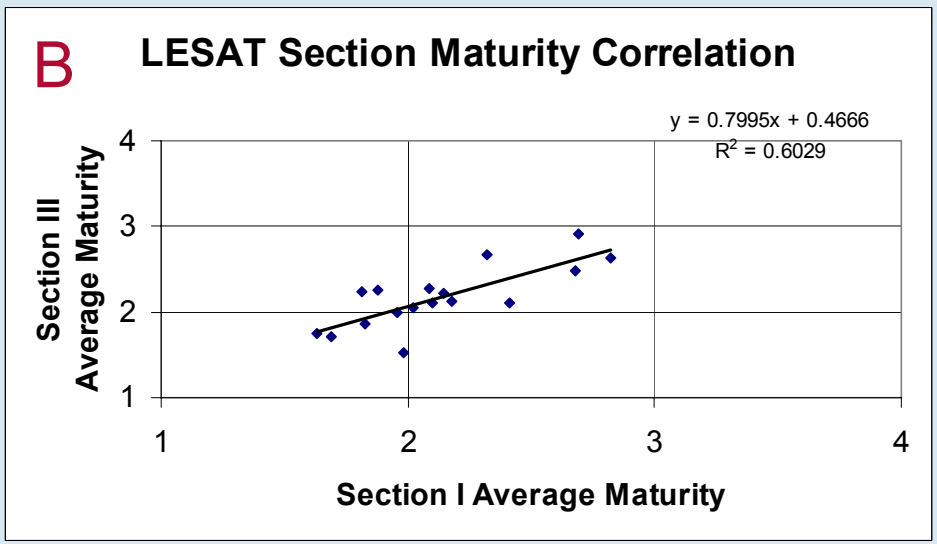
Courtesy of Cory Hallam; Used with Permission

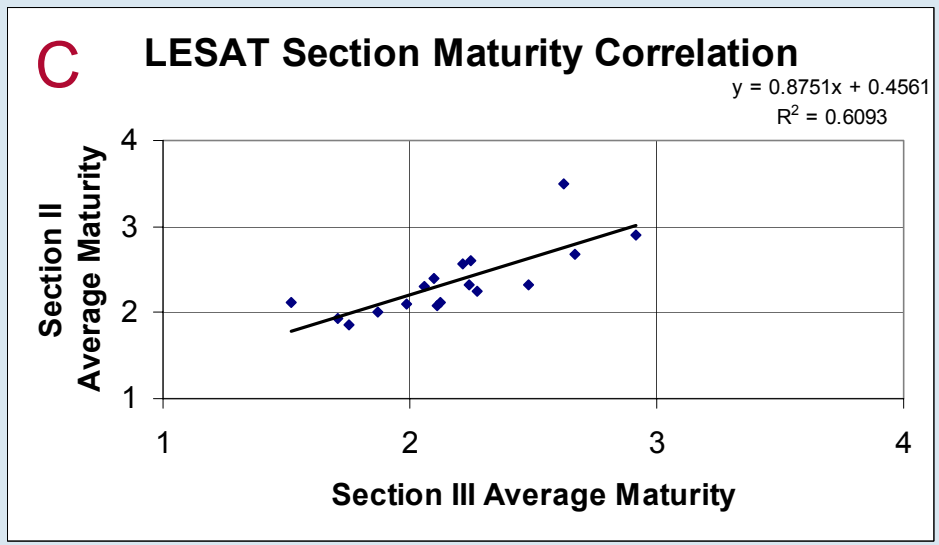
Lean Aerospace Initiative

Results from 18 Enterprises (US and UK)









Courtesy of Cory Hallam; Used with Permission