

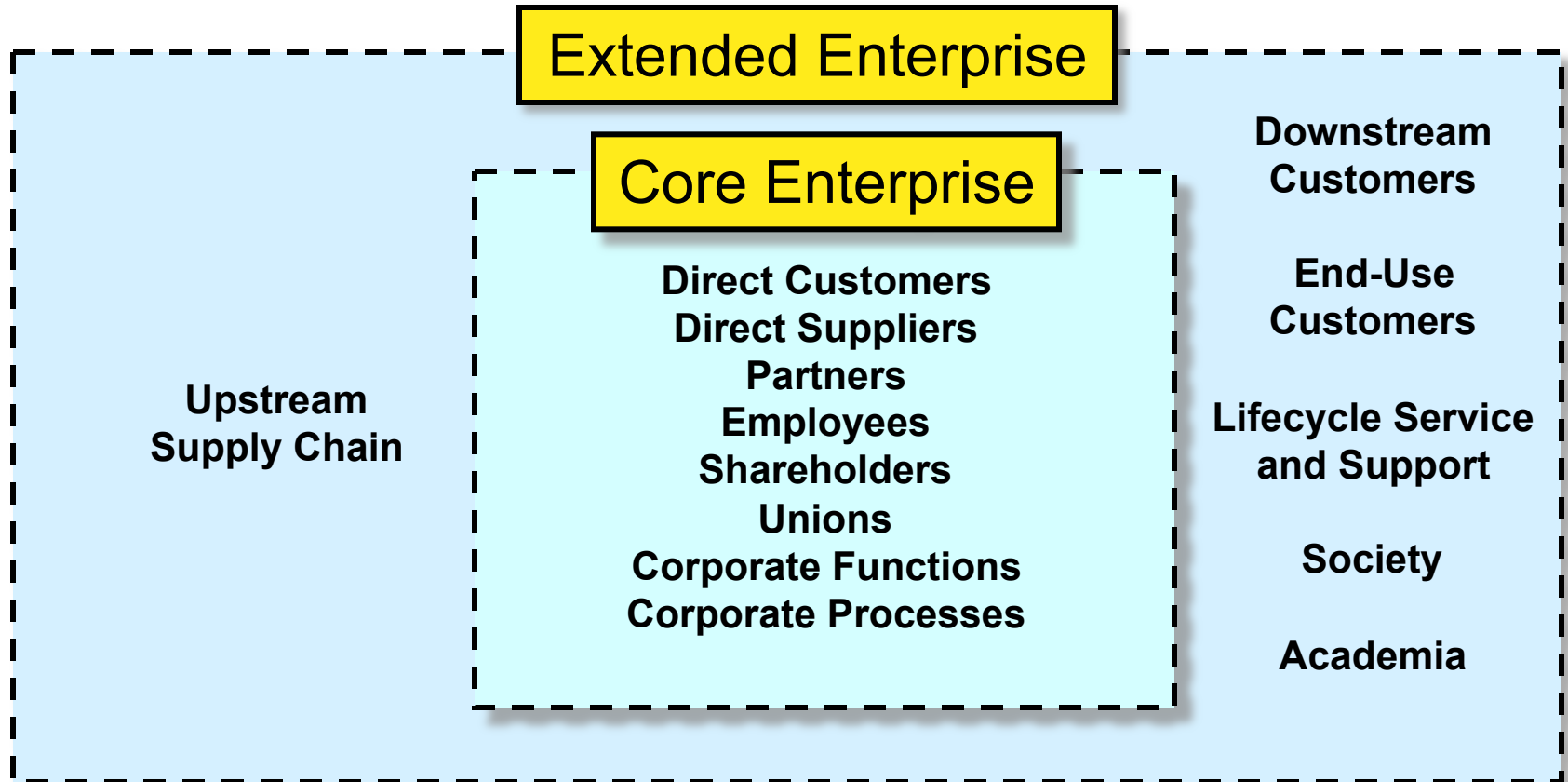


LESAT Facilitator's Workshop

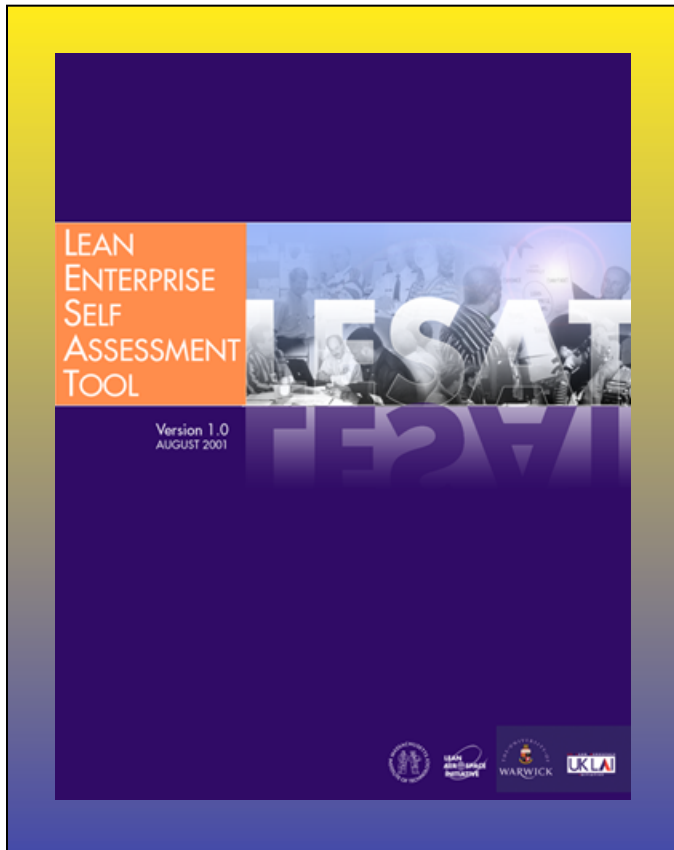
LESAT Overview

Tom Shields
March 27, 2003

Lean Transformation Requires an Enterprise Approach



What Is the Lean Enterprise Self-Assessment Tool (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 assessing
 - (1) Enterprise leadership
 - (2) Life cycle and enabling processes
 - (3) Enabling infrastructure
- Supporting materials: (Facilitator’s Guide, Glossary, etc.)

Source: Lean Aerospace Initiative, MIT © 2001

Perspectives on Assessment

Companies do well in assessing:

- **Financial Performance**
 - Sales Volume
 - Revenue
 - Operating Costs
 - Financial Ratios
- **Operations Performance**
 - Production Costs
 - Productivity
 - Quality
 - Schedule

Perspectives on Assessment

- Companies **do not** do well in tracking progress associated with broad change
 - Often expressed in terms difficult to measure, fuzzy or soft metrics, or even a “gut feeling”
 - “Good things to do” included without metrics
 - Long term improvement tasks – difficult assessing intermediate progress
 - Some improvement tasks dependent upon others
 - Failure to consider “soft” aspects of change; we focus on technical aspects, ignoring people and social interactions



Workshop Participants' Views

Are there other reasons that companies do not do well in tracking progress associated with broad change?

➤ **1.**

➤ **2.**

➤ **3.**

➤ **4.**

➤ **5.**

Perspectives on Assessment

- **Most LAI members have launched “lean change initiatives”**
- **Many have used LAI’s TTL Roadmap**
- **Experience with TTL led early adopters to ask:**
 - **How lean are we?**
 - **How do we know how much progress we have made?**
 - **Where should we focus next?**

LESAT is intended to address these questions

How Do We Assess Our 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

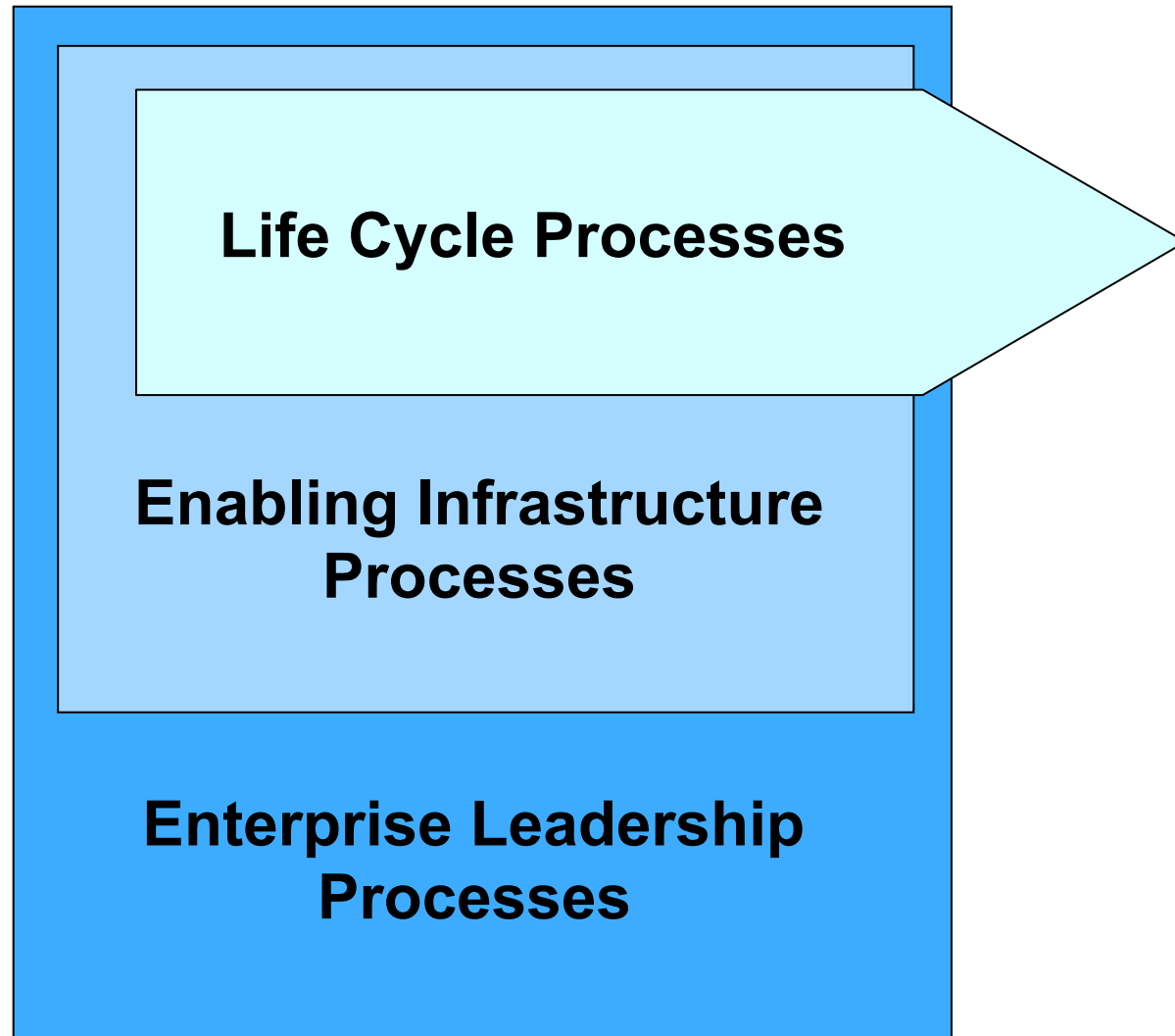
**Targeted at Enterprise Leadership Team
(enterprise leader and direct reports)**



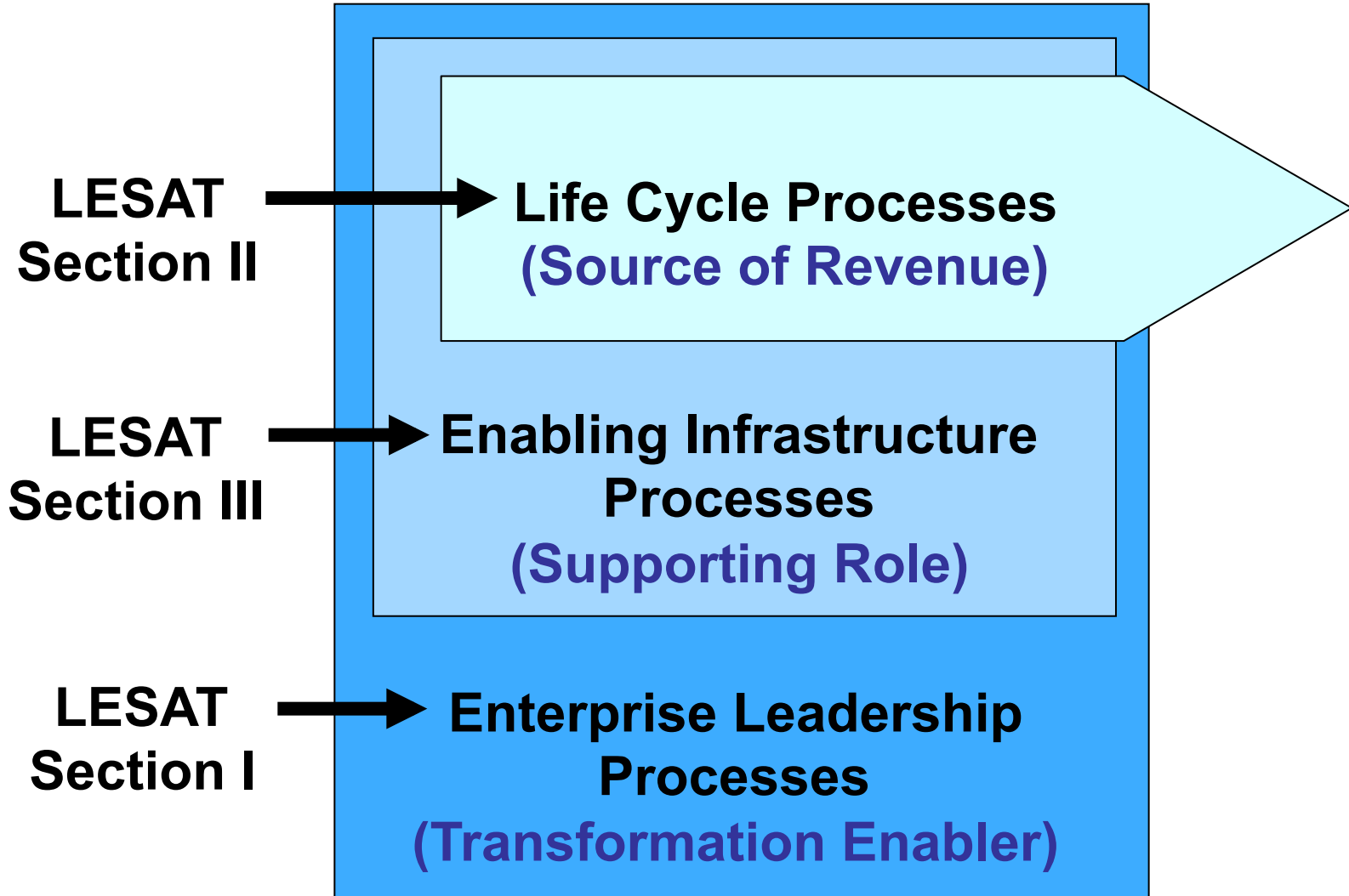
LESAT Tool Requirements (Survey of LAI Consortia Members)

- **Simple, easy to use by enterprise leadership**
- **Focus on lean attributes**
- **Alignment with business performance planning (goals and results)**
- **Provide guidance for “next steps”**
 - **Gap analysis capability**
- **Ability to accommodate both single and aligned organizations (teaming, partnerships, suppliers) within an enterprise**

LAI Process Architecture View of the Lean Enterprise



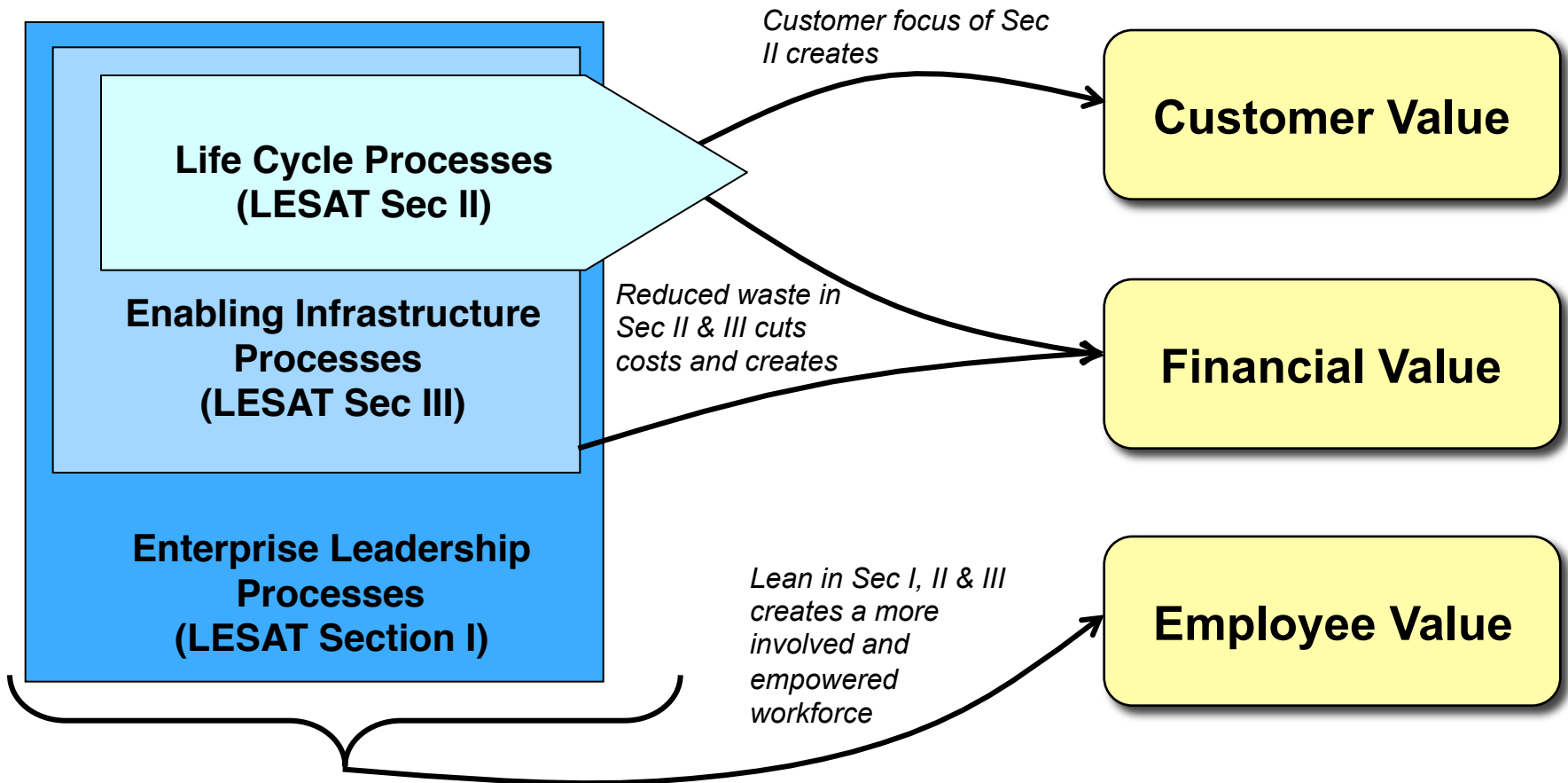
LESAT is Consistent with a Process Architecture View of the Lean Enterprise



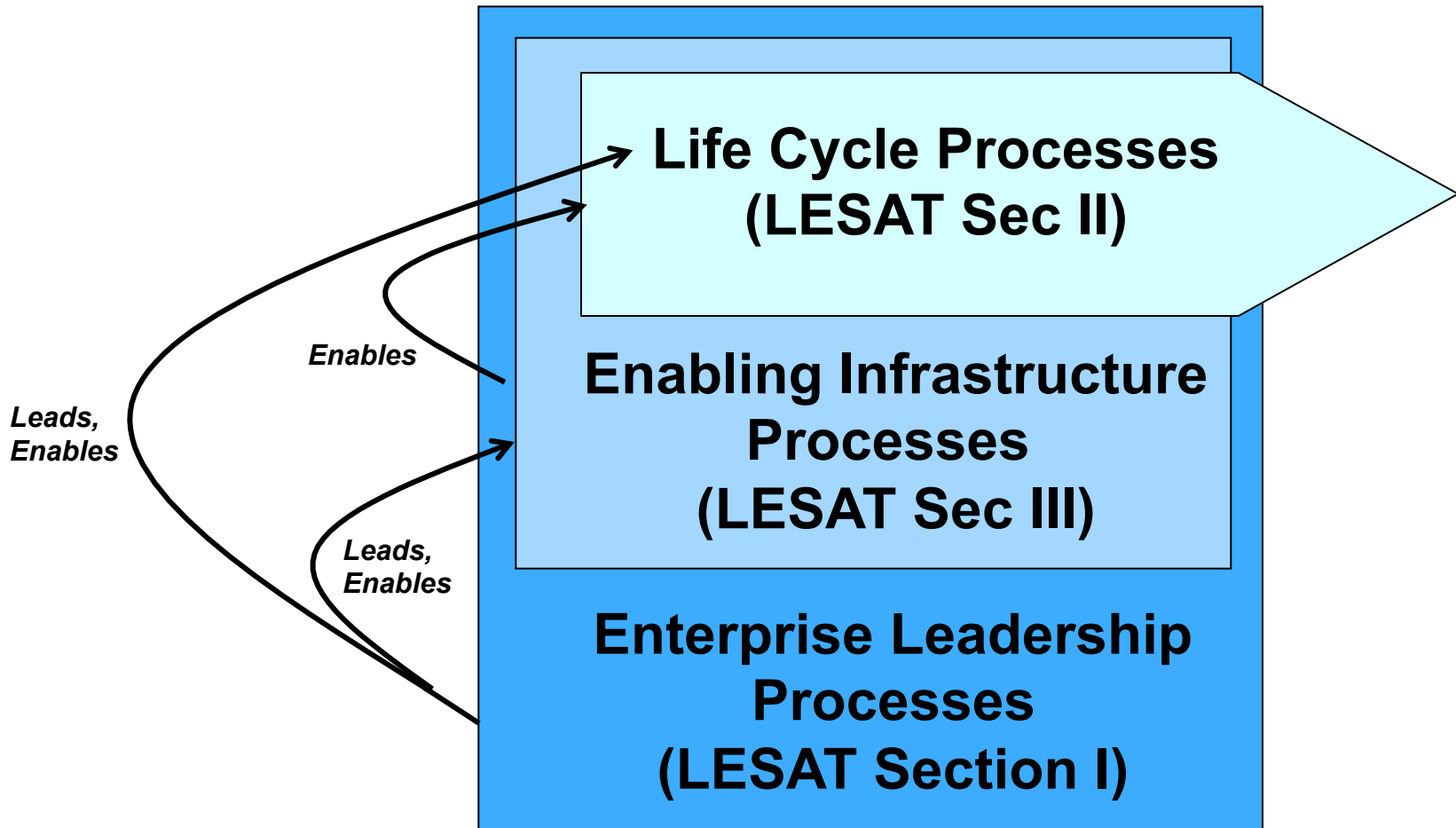
LESAT as a Leading Indicator of Improved Enterprise Value Delivery

State of Enterprise Leanness
(LESAT - Leading Indicators)

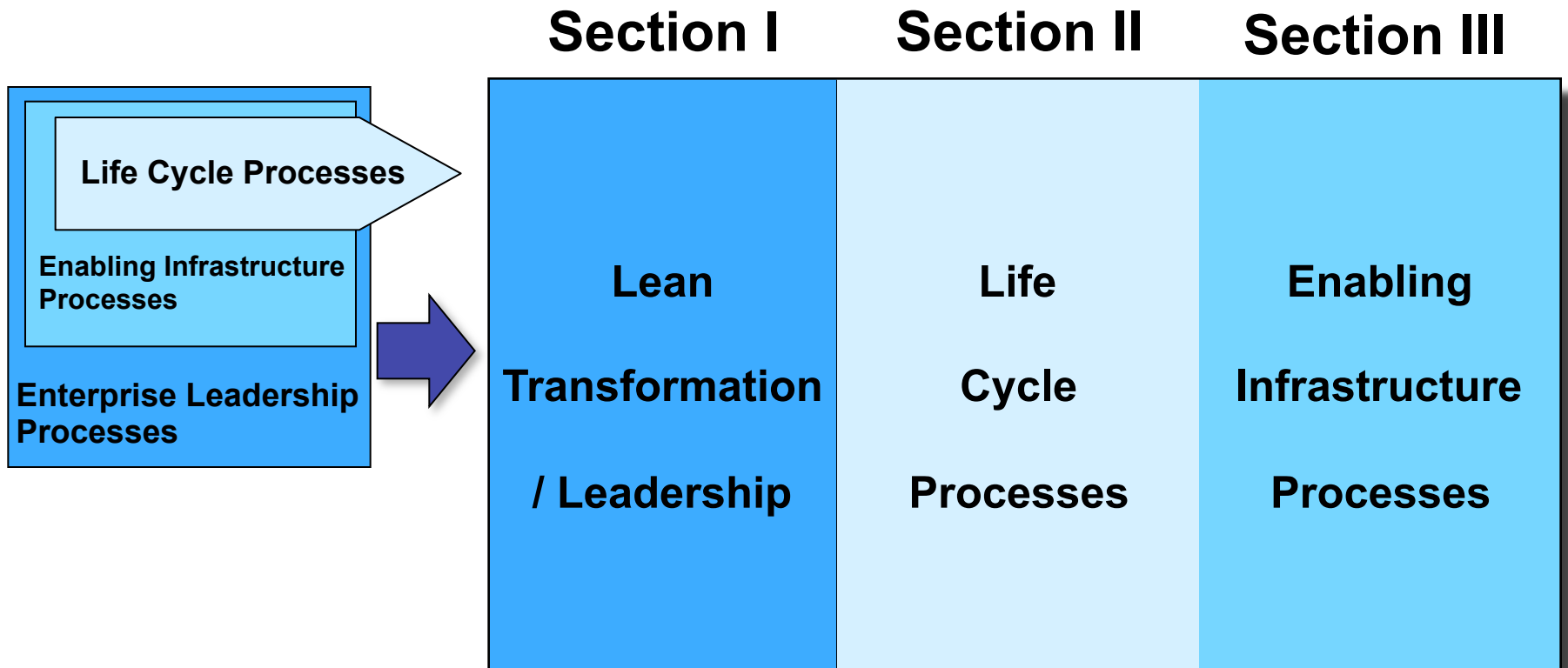
Enterprise Performance Measures
(Lagging Indicators)



Proposed Causal Relations in Lean Enterprise Transformation



LESAT Structure is Consistent with Enterprise Architecture



LESAT Sections

Section I

Transformation / Leadership

The focus is on lean practices and processes that are developed and maintained at the top level of the enterprise to guide its lean activities.

Section II

Lifecycle Processes

These processes result in value delivery to the customer and stakeholders over the life of the product or service.

Section III

Enabling Infrastructure

These enabling processes provide supporting services to other organizational units whom they serve as internal customers

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**

Generic Capability Maturity Levels

(Facilitator's Guide, pp.13)

Level 5

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

Level 4

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

Level 3

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

Level 2

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

Level 1

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

Maturity Level Definitions Simplified

World Class

Level 5

Recognized Best Practice → ***Transformer***

Level 4

Continuous Improvement → ***Reformer***

Level 3

Systematic Approach → ***Performer***

Level 2

General Awareness → ***Adopter***

Level 1

Minimal Awareness → ***Traditional***

**Lean
Maturation**



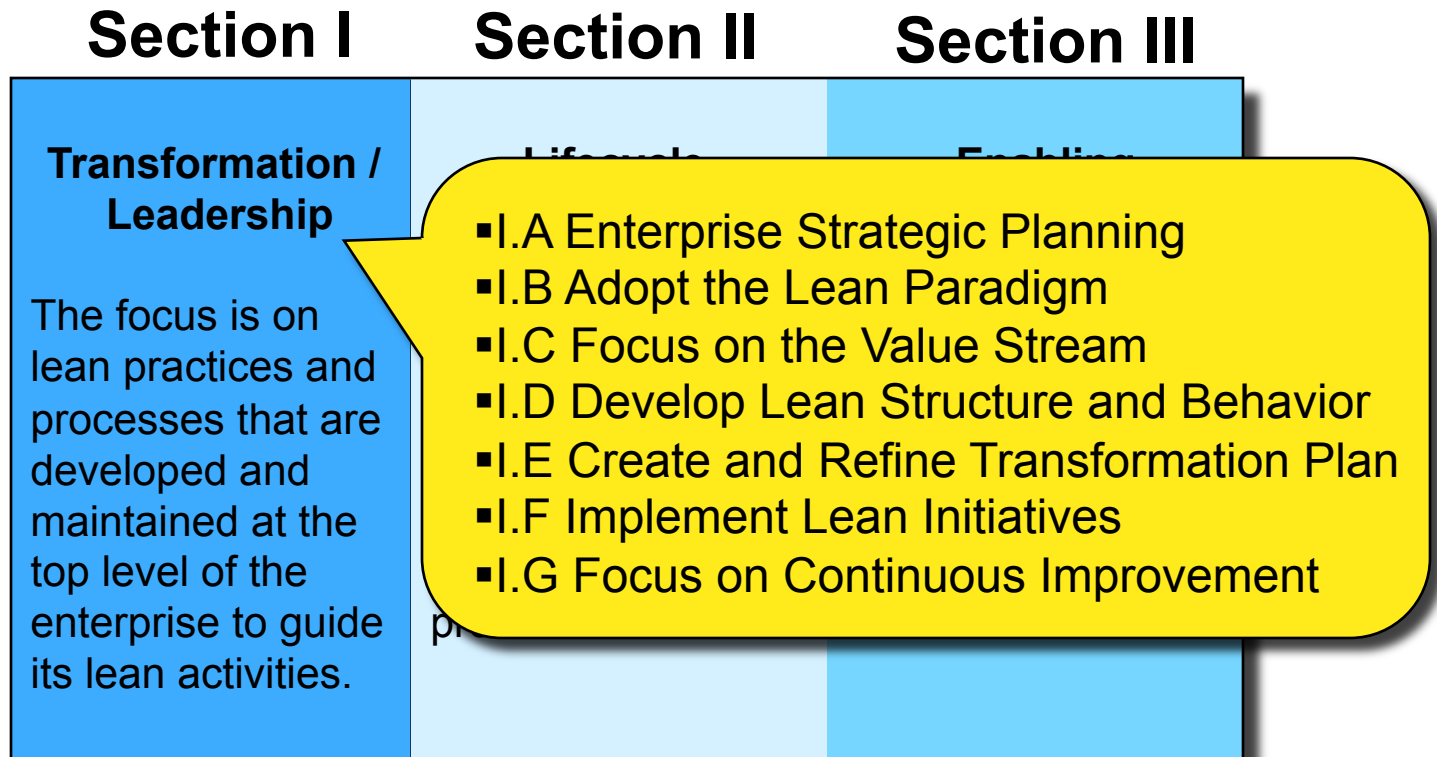
Least Capable

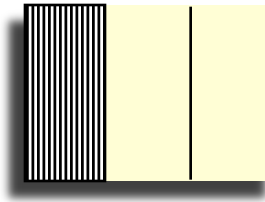


Generic LESAT Maturity Matrix Template

(blue text changes for each practice, green text entered by assessor for each practice)

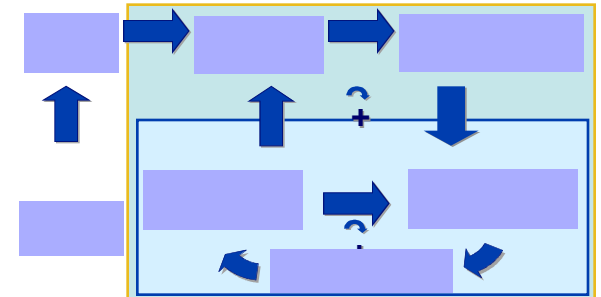
Section, Group # and Group Name: Brief description of this Group number. In Section I, the Group is one of the Primary Activities from the Transition-to-Lean (TTL) Roadmap (blue)											
Diagnostic Questions		1.0 Generic questions regarding the performance of the enterprise relative to this Group of practices (blue)									
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 (blue)	Statement describing little awareness of this lean practice (blue)								Statement describing world-class behavior for this lean practice (blue)	
		C	D	C	D	C	D	C	D	C	D
	Lean Indicators	Outcomes and lean behaviors that an enterprise will exhibit as it proceeds on its Lean transformation (blue)									
	Evidence	Supporting data utilized in assessing the current capability level of the Enterprise on this lean practice (green)									
	Opportunities	Inputs to plans of action to leverage opportunities or to move to the desired level of capability (green)									



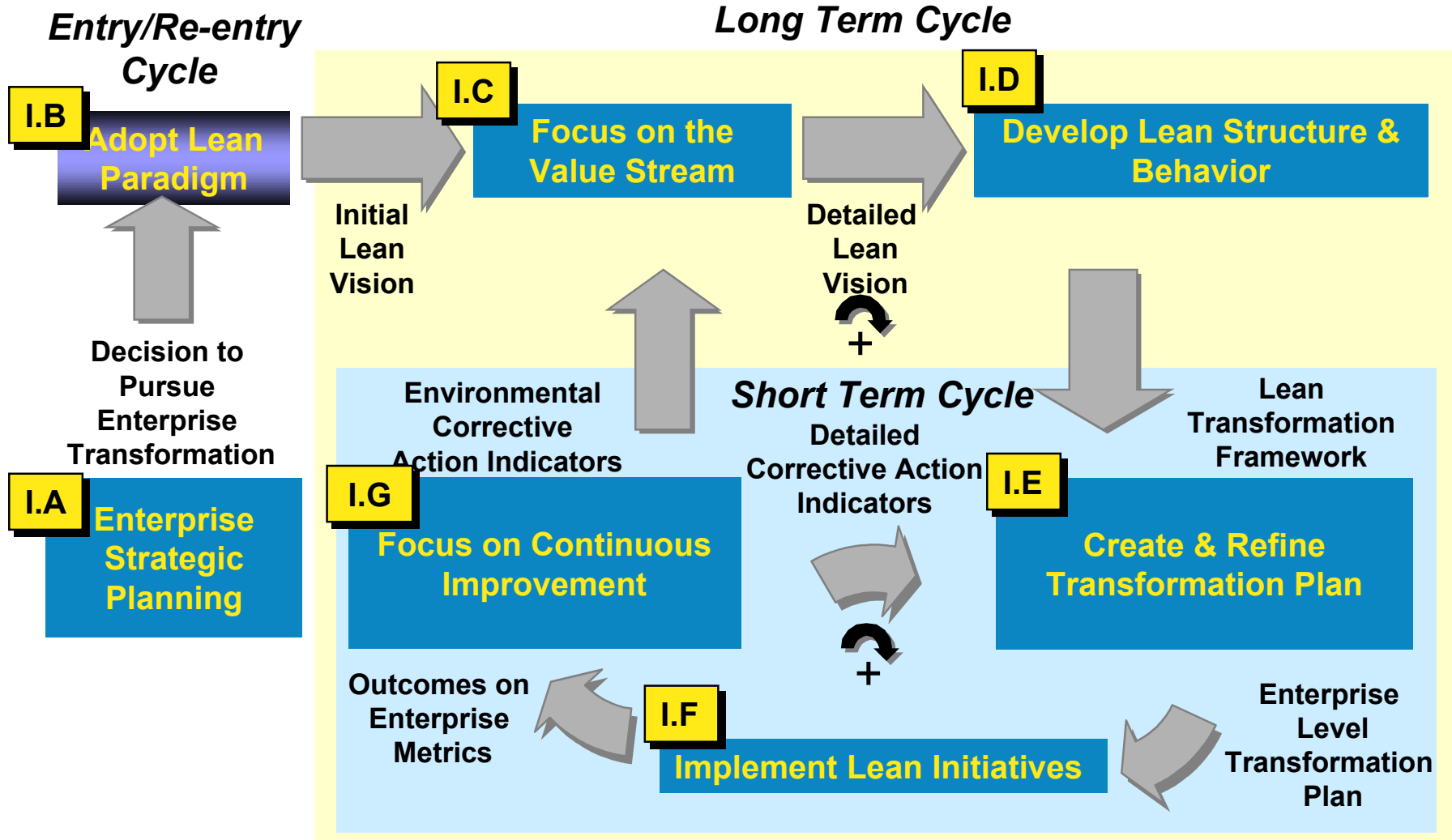


Section I: Lean Transformation/Leadership

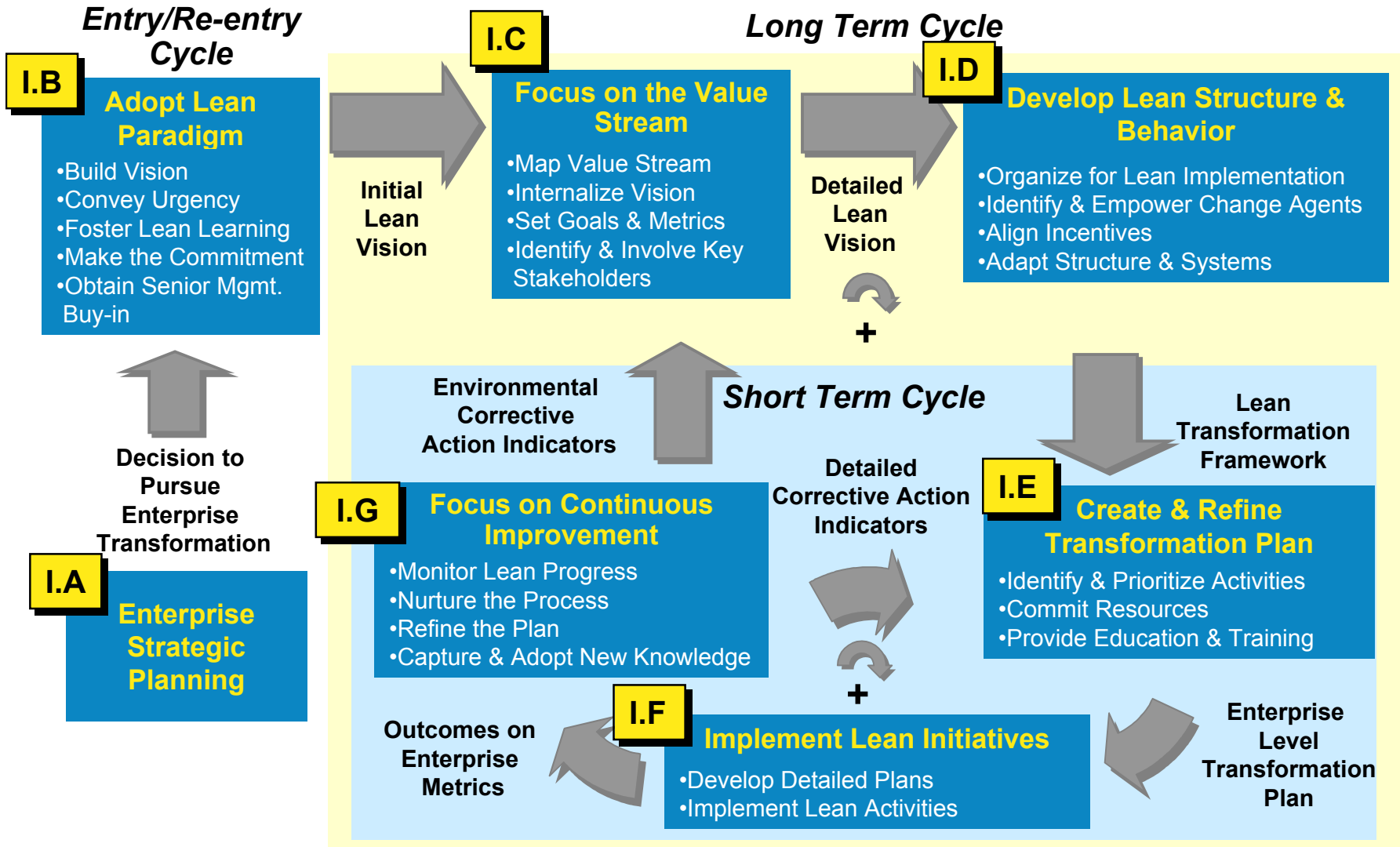
- Practices directly linked to enterprise Transition to Lean Model (TTL)
- Assesses the following elements:
 - Strategic integration
 - Leadership and commitment
 - Value stream analysis and balancing
 - Change management
 - Structure and systems
 - Lean transformation planning, execution and monitoring



Enterprise Transition To Lean (TTL) Roadmap



Enterprise Level Roadmap



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



Example LESAT Practice - 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
- Do enterprise leaders and senior managers understand the lean paradigm at the enterprise level?
 - Do all senior leaders and management 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?

LP#	Lean Practices	Capability Levels									
		Level 1		Level 2		Level 3		Level 4		Level 5	
I.B.3.	Lean Enterprise Vision <i>New mental model of the enterprise</i>	Senior leaders have varying vision of lean, from none to well-defined.		Senior leaders adopt common vision of lean.		Lean vision has been communicated and is understood by most employees.		Common vision of lean is shared by the extended enterprise.		Stakeholders have internalized the lean vision and are an active part of achieving it.	
		C	D	C	D	C	D	C	D	C	D
	Lean Indicators	<ul style="list-style-type: none"> •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										



Diagnostic Questions for I.B - Adopt the Lean Paradigm

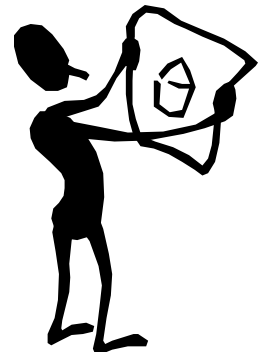
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- | | |
|----------------------|--|
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	Evidence										
	Opportunities										

Diagnostic Questions for I.B - Adopt the Lean Paradigm

- 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?





Maturity Definitions for Practice

I.B.3 - Lean Enterprise Vision

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

- Do enterprise leaders and senior managers understand the lean paradigm at the enterprise level?
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	Evidence										
	Opportunities										

Maturity Definitions for Practice

I.B.3 - Lean Enterprise Vision

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

Level 5

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

Level 4

Common vision of lean is shared by the extended enterprise

Level 3

Lean vision has been communicated and is understood by most employees

Level 2

Senior leaders adopt common vision of lean

Level 1

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

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



Lean Indicators for Practice

I.B.3 - Lean Enterprise Vision

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

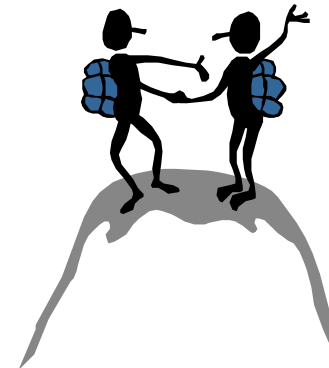
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	Evidence										
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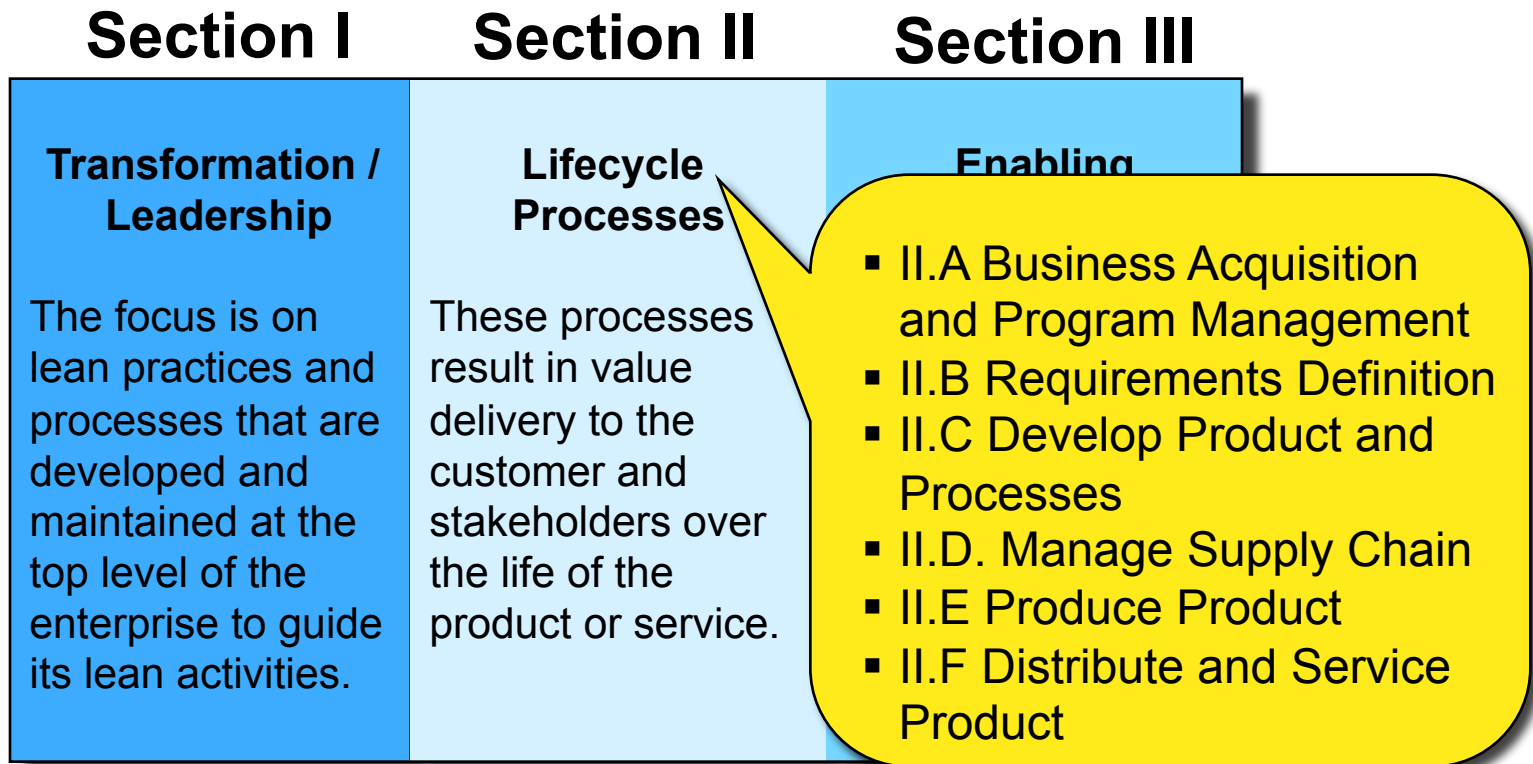
Lean Indicators for Practice

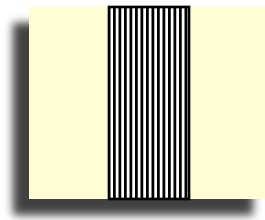
I.B.3 - Lean Enterprise Vision

- 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



LESAT Section II





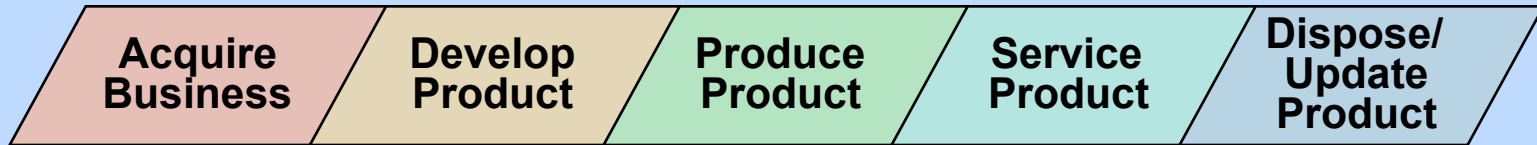
Section II: Life Cycle Processes

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



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

Example LESAT Practice

- 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	<ul style="list-style-type: none"> • 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?
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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 <i>Understanding downstream stakeholders allows value to flow seamlessly to customer</i>	Manufacturing issues are considered late in design.		Manufacturing and assembly issues are considered earlier in projects, but in ad hoc manner. Supplier and cost considerations are limited.		Multi-functional teams include some downstream disciplines and key suppliers.		Priorities of downstream stakeholders are quantified as early as possible in design, and used for process evaluation and improvement.		Downstream stakeholders' values in the extended enterprise are quantified and balanced via tradeoffs, as a continuous part of the process.	
		C	D	C	D	C	D	C	D	C	D
	Lean Indicators (Examples)	<ul style="list-style-type: none"> • 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											



Diagnostic Questions for II.C - Develop Product and Process

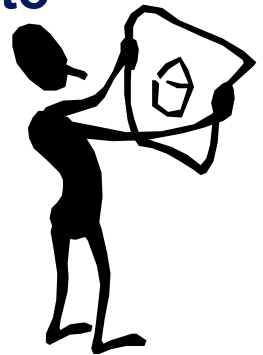
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	Opportunities										

Diagnostic Questions for II.C - Develop Product and Process

- Is the product development process formalized and understood?
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- Are products and processes being developed concurrently?





Maturity Definitions for Practice II.C.2 - Incorporate Downstream Stakeholder Values

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.

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	Evidence										
	Opportunities										



Maturity Definitions for Practice II.C.2 - Incorporate Downstream Stakeholder Values

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

Level 5

Downstream stakeholders' values in the extended enterprise are quantified, and balanced via tradeoffs, as a continuous part of the process

Level 4

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

Level 3

Multi-functional teams include some downstream disciplines and key suppliers

Level 2

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

Level 1

Manufacturing issues are considered late in design



Lean Indicators for Practice II.C.2 - Incorporate Downstream Stakeholder Values

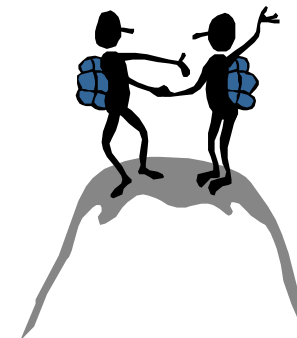
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LP#	Lean Practices	Capability Levels									
		Level 1		Level 2		Level 3		Level 4		Level 5	
II.C.2	Incorporate Downstream Stakeholder Values (Manufacturing, Support, etc.) into Products and Processes <i>Understanding downstream stakeholders allows value to flow seamlessly to customer</i>	Manufacturing issues are considered late in design.		Manufacturing and assembly issues are considered earlier in projects, but in ad hoc manner. Supplier and cost considerations are limited.		Multi-functional teams include some downstream disciplines and key suppliers.		Priorities of downstream stakeholders are quantified as early as possible in design, and used for process evaluation and improvement.		Downstream stakeholders' values in the extended enterprise are quantified and balanced via tradeoffs, as a continuous part of the process.	
		C	D	C	D	C	D	C	D	C	D
	Lean Indicators (Examples)	<ul style="list-style-type: none"> • 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											

Lean Indicators for Practice II.C.2 - Incorporate Downstream Stakeholder Values

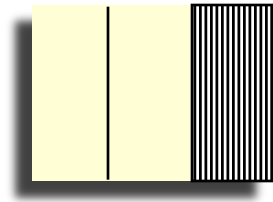
- There is early consideration and incorporation of downstream stakeholder issues throughout design development
- The scope of considerations integrated into designs has been extended to include manufacturing, assembly, serviceability and cost considerations
- Products are easier to produce and have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



LESAT Section III

Section I	Section II	Section III
<p>Transformation /</p> <p>lean practices and processes that are developed and maintained at the top level of the enterprise to guide its lean activities.</p>	<p>Lifecycle</p> <p>result in value delivery to the customer and stakeholders over the life of the product or service.</p>	<p>Enabling Infrastructure</p> <p>These enabling processes provide supporting services to other organizational units whom they serve as internal customers</p>

- III.A Lean Organizational Enablers
- III.B Lean Process Enablers



Section III: Enabling Infrastructure

Assess critical supporting processes

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



LESAT Section III - 8 Lean Practices

III.A. Lean Organizational Enablers

III.A.1 Financial system supports Lean transformation

III.A.2 Enterprise stakeholders pull required financial information

III.A.3 Promulgate the Learning Organization

III.A.4 Enable the Lean enterprise with information systems and tools

III.A.5 Integration of environmental protection, health and safety into the business

III.B. Lean Process Enablers

III.B.1 Process standardization

III.B.2 Common tools and systems

III.B.3 Variation reduction



Example LESAT Practice

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 | <ul style="list-style-type: none"> 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 <i>Lean requires appropriate financial data</i>	Finance system provides basic balance sheet and cost accounting data; there is little awareness and exploration of broader support roles for finance.	Initial efforts are underway to adapt or modify systems to compensate for the inadequacies of the formal financial system.	Finance system is overhauled to provide data and financial information to support and enable a lean transformation at any level.	Financial system scope is expanded to integrate with non-traditional measures of value creation (e.g., intellectual capital, balanced scorecard, etc.).	Financial systems provide seamless information exchange across the extended enterprise, with emphasis on value creation for all stakeholders.
		C D	C D	C D	C D	C D
	Lean Indicators	<ul style="list-style-type: none"> 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						



Diagnostic Questions for III.A - Lean Organizational Enablers

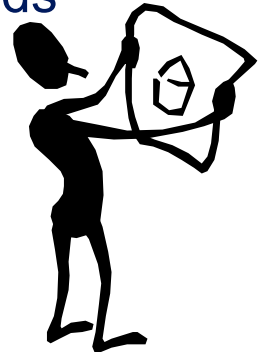
III.A. Lean Organization Enablers - The support units of an enterprise infrastructure must support the implementation of lean principles, practices and behavior.

- | | |
|----------------------|---|
| Diagnostic Questions | <ul style="list-style-type: none"> 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? |
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	Evidence					
	Opportunities					

Diagnostic Questions for III.A - Lean Organizational Enablers

- 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?





Maturity Definitions for Practice

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 | <ul style="list-style-type: none"> • 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? |
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		C D	C D	C D	C D	C D
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	Evidence					
	Opportunities					

Maturity Definitions for Practice III.A - Lean Organizational Enablers

Financial system supports lean transformation - *Lean requires accurate assessment of value stream activities*

Level 5

Financial systems provide seamless information exchange across the extended enterprise, with emphasis on value creation for all stakeholders.

Level 4

Financial system scope is expanded to integrate with non-traditional measures of value creation (e.g., intellectual capital, balanced scorecard, etc.).

Level 3

Finance system is overhauled to provide data and financial information to support and enable a lean transformation at any level.

Level 2

Initial efforts are underway to adapt or modify systems to compensate for the inadequacies of the formal financial system.

Level 1

Finance system provides basic balance sheet and cost accounting data; there is little awareness and exploration of broader support roles for finance.

Lean Indicators for Practice

III.A - Lean Organizational Enablers

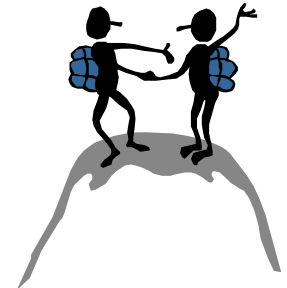
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	Evidence					
	Opportunities					

Lean Indicators for Practice III.A - Lean Organizational Enablers

- 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.



Review Other LESAT Practices?

- As a LESAT facilitator you will be asked to clarify some of the practices to assessors

Are there any other practices that you would like clarification on now?

Participants Should be Able to...

- **Understand role of assessment**
- **Understand “process architecture view of Lean Enterprise”**
- **Understand that assessment, even of core processes and infrastructure processes is at enterprise level**
- **Understand the LESAT Maturity Matrix Format and how matrices are completed**
- **Obtain Enterprise Leader’s commitment to personally sponsor & participate in assessment**