



Lean Enterprise Model

Goeff Bentley

Visiting Scholar, Lean Enterprise Team

Debbie Nightingale

MIT Professor & LEM Product Team Lead

Abhinav Taneja

MIT Graduate Student

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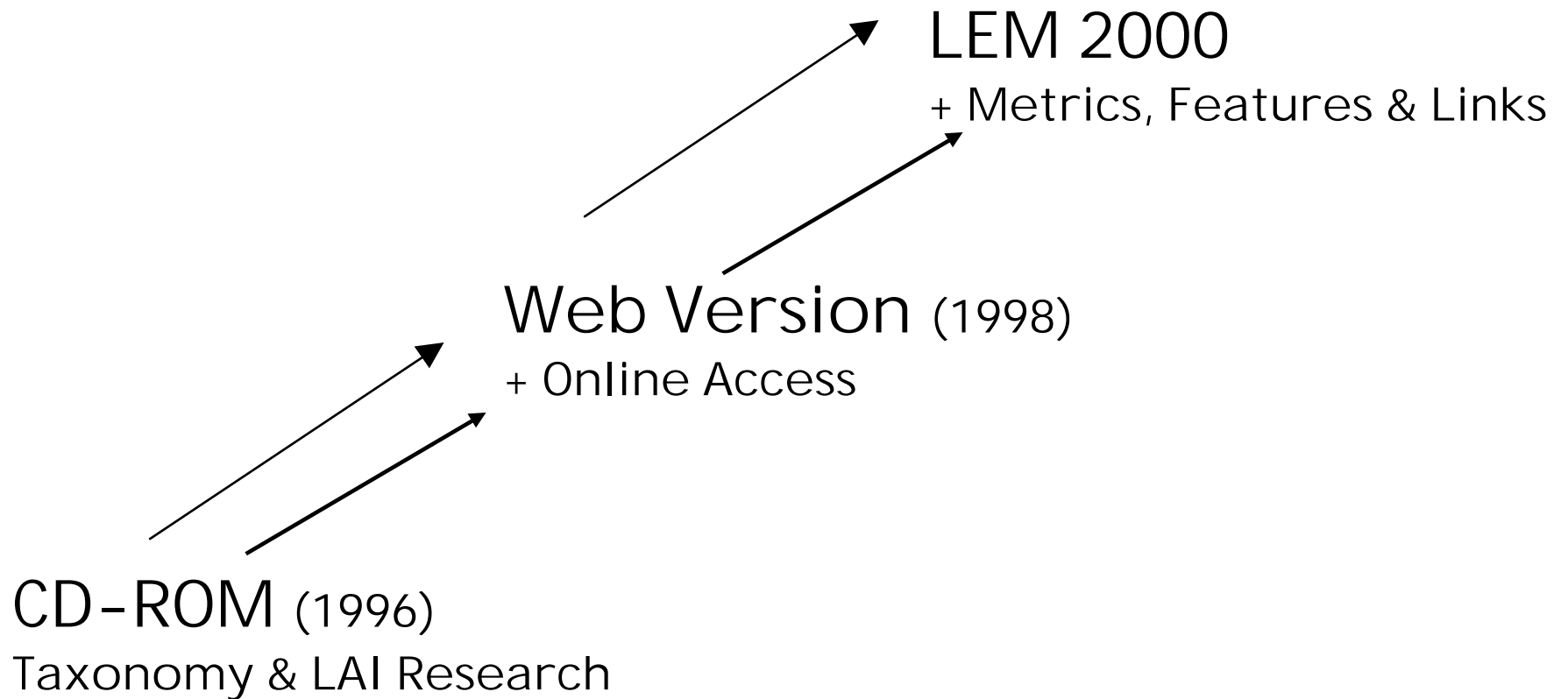
Reminder--What the LEM Is

◆ Insight Tool

- a framework for organizing lean principles, practices & supporting examples
- value stream focus on customer; product creation, fabrication & assembly; supply chain; people & organizations; policy & environment; information systems

◆ Electronic Library

- originally for LAI research mapped to LEM

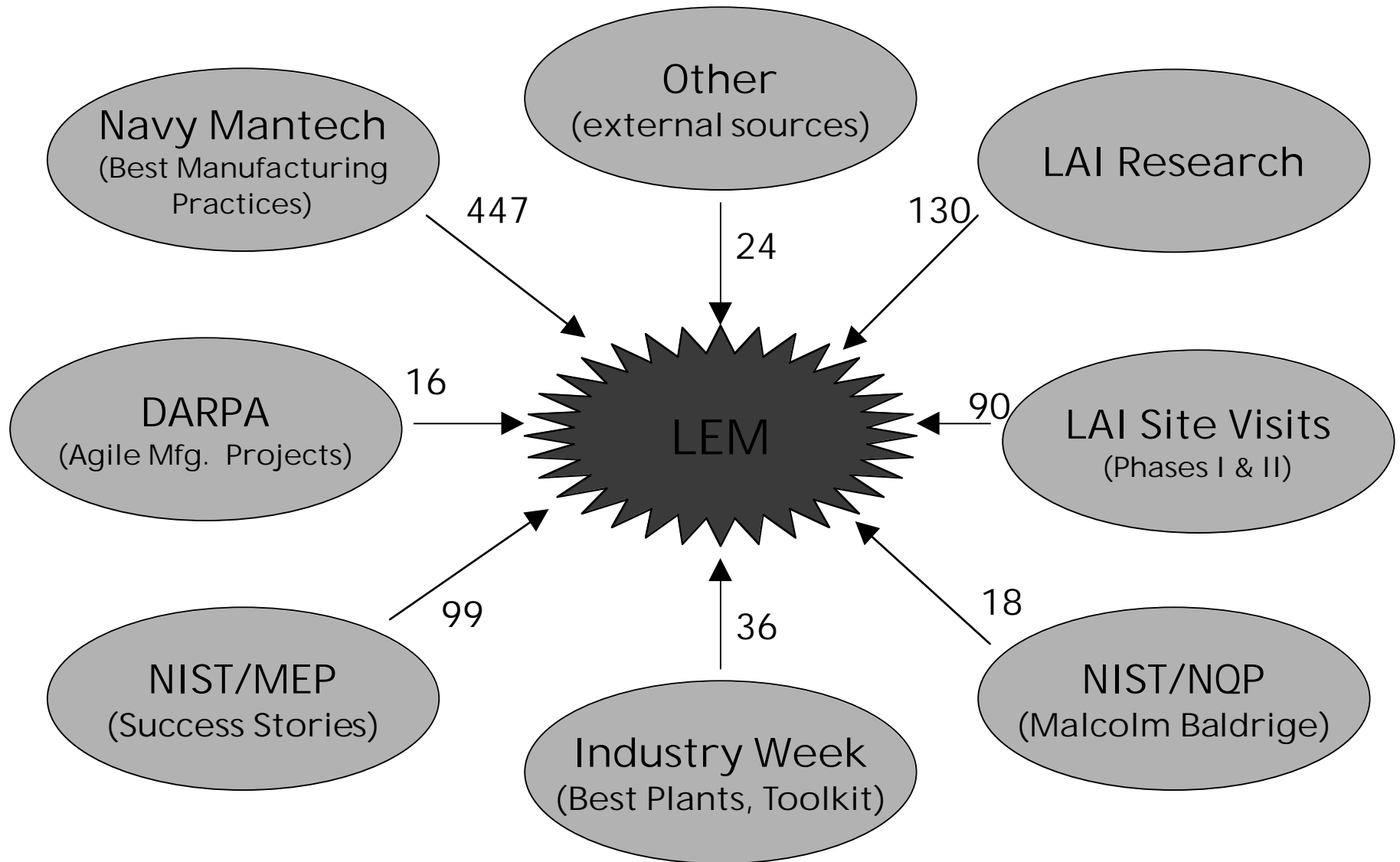


Evolving User Needs & Expanding Internet Technology

- ◆ More Reports & Links
 - from 100 to over 800
 - some Reports have multiple LEM links
- ◆ Metrics Review & Consolidation
 - 38 by Flow Time, Stakeholder Satisfaction, Resource Utilization & Quality Yield
 - designated as to type--Output (enabling) or Outcome (results) Metrics
 - most Reports have at least one Metric

- ◆ Selection and Navigation Features
 - Browse by LEM Architecture
 - Practice (focus area) of interest
 - Reports by Type, Source & Metrics
 - Search by Title, Metrics & Key Words
 - Metrics dialog box
 - Search (word) field
 - Reports by Type, Source & Metrics

More Reports & Links



Metrics by Category

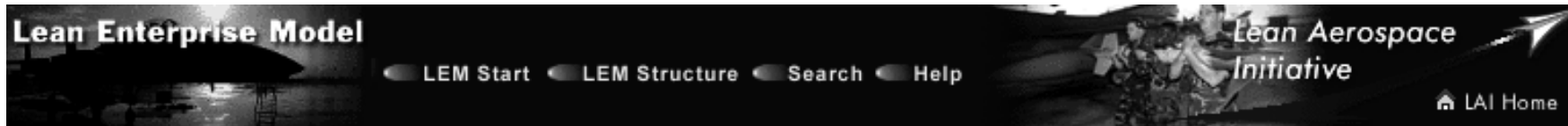
Metrics	Flow Time (velocity of value chain)		Stakeholder Satisfaction (trust, sharing)		Resource Utilization (asset management)		Quality Yield (change in quality-cost)	
	Output	Outcome	Output	Outcome	Output	Outcome	Output	Outcome
Cycle Time-Manufacturing		X						
Cycle Time-Order to Delivery		X						
Cycle Time-Product Development		X						
Cycle Time-Software Development		X						
Flow Efficiency	X							
Information Release/Retrieval Time	X							
Process Flow	X							
Purchased Parts Lead Time		X						
Throughput Time		X						
Certification of Competency-Suppliers			X					
Continuous Cost/Price Improvement				X				
Customer and Supplier Relationships inc. IPTs			X					
Customer Satisfaction Surveys				X				
Employee Involvements inc. Management Partnerships & Multiple Function IPTs			X					
Employee Satisfaction inc. Self Empowerment, Use of Suggestions/Communications & Rewards Programs, etc			X					
Employee Turnover Rate				X				
Long Term Supplier Agreements			X					
On Time Deliveries				X				
Commonality of Databases-intra, customers, and/or suppliers					X			
Cost of Quality inc. Costs of Scrap, Rework, Warranty & Inspection						X		
Environmental Savings/Technology Use						X		
Inventory Reduction						X		
Inventory Turns						X		
JIT					X			
Non-Value Added Activities & Resources					X			
Organizational Effectiveness					X			
Output per Employee						X		
Paperless Technology					X			
Return On Assets						X		
Standardized Processes, Tools & Practices inc. Preventive Maintenance					X			
Training					X			
Baseline Change Effectiveness							X	
Defects & Defects Rate								X
Design Drawing/Engineering Changes or Rejection Reports								X
First Pass Product Quality Yield								X
Process Effectiveness Measures inc. Cpk Ratio and Use of SPC							X	
Scrap, Rework Rate								X
Software Errors Reduction						X	X	

Lean Aerospace
Initiative

MIT

Examples of New Features in LEM 2000

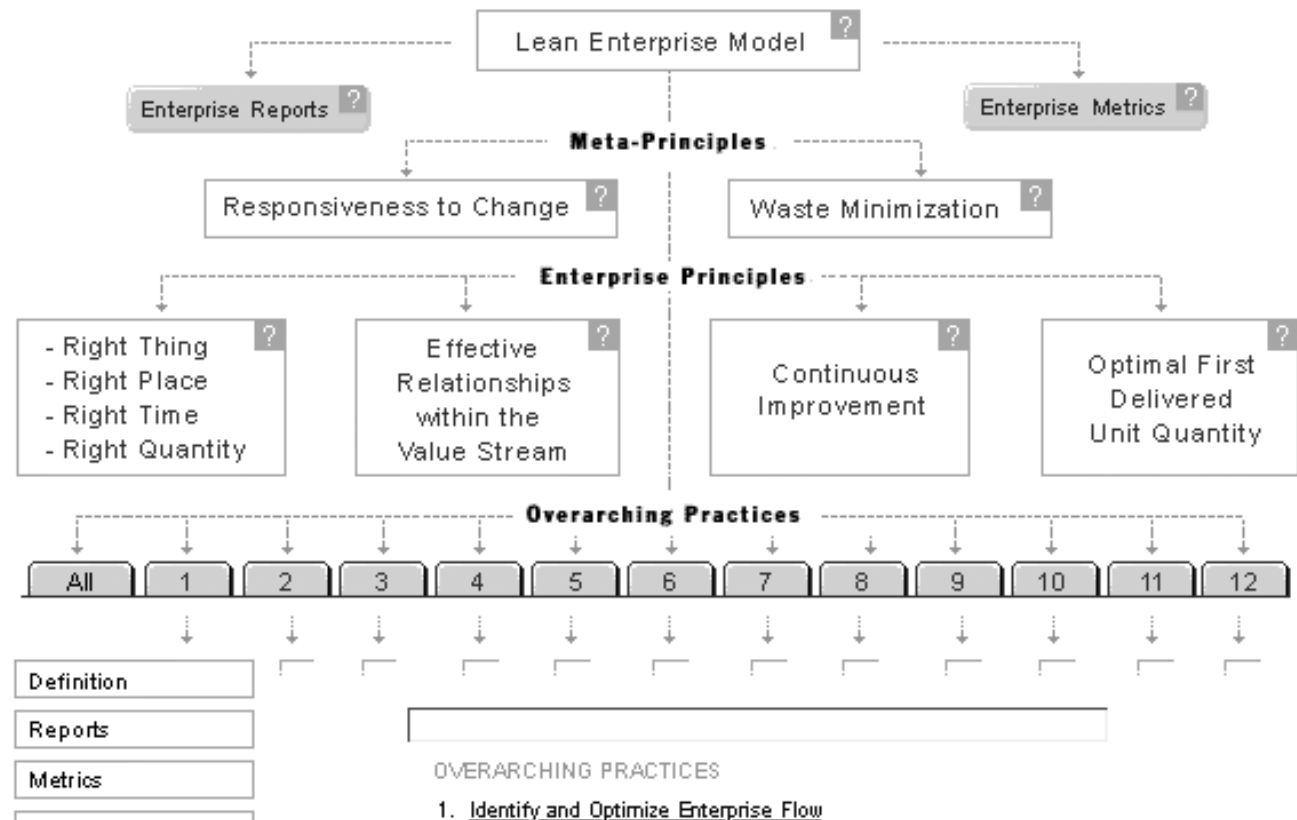
Examples of New Features in LEM 2000



LEM Structure

Click on the **?** icon for description.

Click on the yellow button for more information.



Click on *All & Metrics Box*

The screenshot shows the 'Lean Enterprise Model' web application. At the top, there is a navigation bar with 'Lean Aerospace Initiative' and 'LAI Home' on the right, and 'LEM Start', 'LEM Structure', 'Search', and 'Help' in the center. Below this is a 'Metrics' section with a 'Flow Time' tab selected. A sidebar on the left contains a menu with 'All Overarching Practices', 'Definition', 'Reports', and 'Metrics' (highlighted). The main content area displays a list of metrics under the 'Flow Time' category, each with a folder icon and a count.

Lean Enterprise Model LEM Start LEM Structure Search Help Lean Aerospace Initiative LAI Home

Overarching Practices All 1 2 3 4 5 6 7 8 9 10 11 12

All Overarching Practices

Definition

Reports

Metrics

Flow Time Stakeholder Satisfaction Resource Utilization Quantity Yield

Select a Metric below for relevant Reports.

- 27 [Cycle Time-Manufacturing](#)
- 18 [Cycle Time-Order to Delivery](#)
- 14 [Cycle Time-Product Development](#)
- 4 [Cycle Time-Software Development](#)
- 4 [Flow Efficiency](#)
- 14 [Information Release/Retrieval Time](#)
- 21 [Process Flow](#)
- 4 [Purchased Parts Lead Time](#)
- 14 [Throughput Time](#)

Click on
OAP #12 & Metrics
Box

Lean Enterprise Model | LEM Start | LEM Structure | Search | Help | Lean Aerospace Initiative | LAI Home

Overarching Practices: All | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12

Select a Metric below for relevant Reports.

Resource Utilization

- 8 [Environmental Savings/Technology Use](#) | \$ or % savings
- 3 [Non-Value Added Activities & Resources](#) | costs associated with ave. time/set-up/instructions, lost work days, etc.
- 1 [Organizational Effectiveness](#) | # organization/classification levels, % of support tasks performed by production workers, etc.
- 1 [Output per Employee](#) | \$ per employee

Quality Yield

- 7 [Baseline Change Effectiveness](#) | # or % over time

Lean Enterprise Model | LEM Start | LEM Structure | Search | Help | Lean Aerospace Initiative | LAI Home

Overarching Practice: All | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12

Quality Yield

[Back to Metrics List](#)

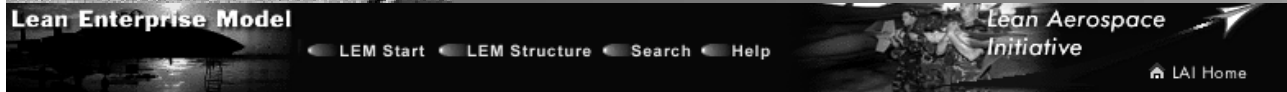
Baseline Change Effectiveness

Type: All | Source: All | [Reset to All](#)

7 Reports from all Types and Sources | Show MIT & Other Research only. (☆) | [Search](#)

Title	Type	Source	Date	OAP	EP
Research Reports - in Overarching Practice 12					
★ Procurement quantity and unit cost changes	Benchmarking	LAI	5/4/98	12	0
★ Number of Program Re-baselines by Program Phase	Benchmarking	LAI	4/23/98	12	0
★ Program Schedule Changes by Program Phase	Benchmarking	LAI	4/23/98	12	0
★ Government Program Plan Stability	Benchmarking	LAI	8/26/96	12	0
Other Reports - in Overarching Practice 12					

Click on *Metric* of Interest



Welcome

Report Search

cycle time

- Titles
(all Reports)
- Metrics
(all Reports with metrics)
- Keywords
(LAI Reports)

Search

Data Matches

Type: All Source: All

11 Reports from all Types and Sources Show MIT & Other Research only. (★)

Title	Type	Source	Date	OAP	EP	SP
Matching Titles						
★ Cycle Time Reduction Achieved Through Software Factory Standardization	Benchmarking	LAI	10/14/96	5	8	0
★ Reductions in Product Development Cycle Time Achieved Using Integrated Product Development	Benchmarking	LAI	10/14/96	5	0	0
★ Planned Cycle Time	Benchmarking	LAI	10/13/96	1	0	0
★ Cycle time from order to shipment for most important product by responding business units, 1994/1995	Benchmarking	LAI	7/31/96	1	0	0
Cycle Time Reduction (Mason & Hanger-Pantex Plant)	Best Practice		6/9/99	9	1	0
Cycle Time Reduction (Mason & Hanger-Pantex Plant)	Best Practice		6/9/99	8	3	0

Search by Title on
Cycle Time



Welcome

Report Search

cycle time

- Titles
(all Reports)
- Metrics
(all Reports with metrics)
- Keywords
(LAI Reports)

Search

Flow Time

[Cycle Time-Order to Delivery](#)

Type: All Source: All

18 Reports from all Types and Sources Show MIT & Other Research only. (★)

Title	Type	Source	Date	OAP	EP	SP
Research Reports						
★ Ford Electronics Non-member Benchmarking	Benchmarking	LAI	7/7/99	1	0	
★ Planned Cycle Time	Benchmarking	LAI	10/13/96	1	0	
★ Cycle time from order to shipment for most important product by responding business units, 1994/1995	Benchmarking	LAI	7/31/96	1	0	
Other Reports						
Automated Purchase Order System (Rockwell Collins)	Best Practice		12/17/99	2	4	
A Winning Approach for Improvement (External Data Source)	Best Practice	Other	10/16/99	11	1	
Jacquart Fabric Products-Michigan (1999)	Best Practice		1/15/99	1	2	
Purchasing Performance Benchmarks (External Data Source)	Benchmarking	Other	9/24/98	10	2	

Search by Metrics on
Cycle Time-Order to Delivery

- ◆ More Robust
- ◆ More Versatile
- ◆ More Useful
- ◆ Work in Progress