Measuring the Impact of Product Lifecycle Management: An Assessment Model and Metrics Framework

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Introduction

- Measure the impact of PLM
  - How well are we PLMing?
  - Can we enhance the traceability of our PLM investments?

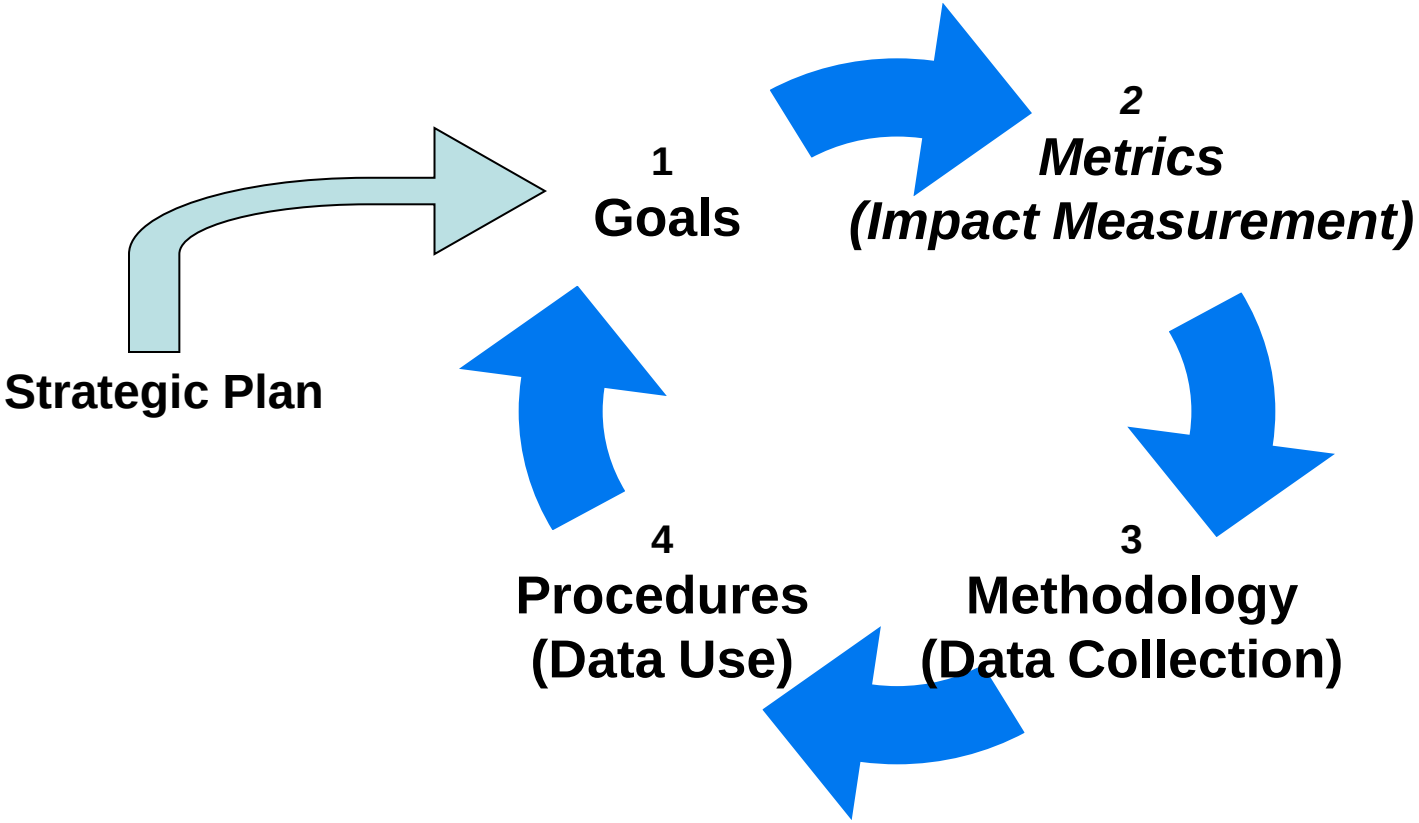
PLM Metrics Project

– Define an Assessment Process

– Define a Metrics Framework

Assessment Model

PLM Assessment Process Model



Metrics Framework

PLM/Lean Thinking
Savings due to *Waste Reduction*

- To all aspect of a product's life
  - *Plan/design*
  - *Build*
  - *Support*
  - *Removal/dispose*

- Integrated, information-driven approach to reducing wastes associated with
  - *Time*
  - *Energy*
  - *Materials*

- Across
  - *People*
  - *Processes and practices*
  - *Technology*

Grieves, M., *Product Lifecycle Management: Driving the Next Generation of Lean Thinking* The McGraw-Hill Co., Inc. New York, 2006, pp 39.

PLM – Next Generation Lean
Revenue Generation due to *Innovation*

- Provides opportunities to reallocate captured resources toward ***innovation***
  - *Functionality*
  - *Quality*

- Across
  - *Product*
  - *Process*

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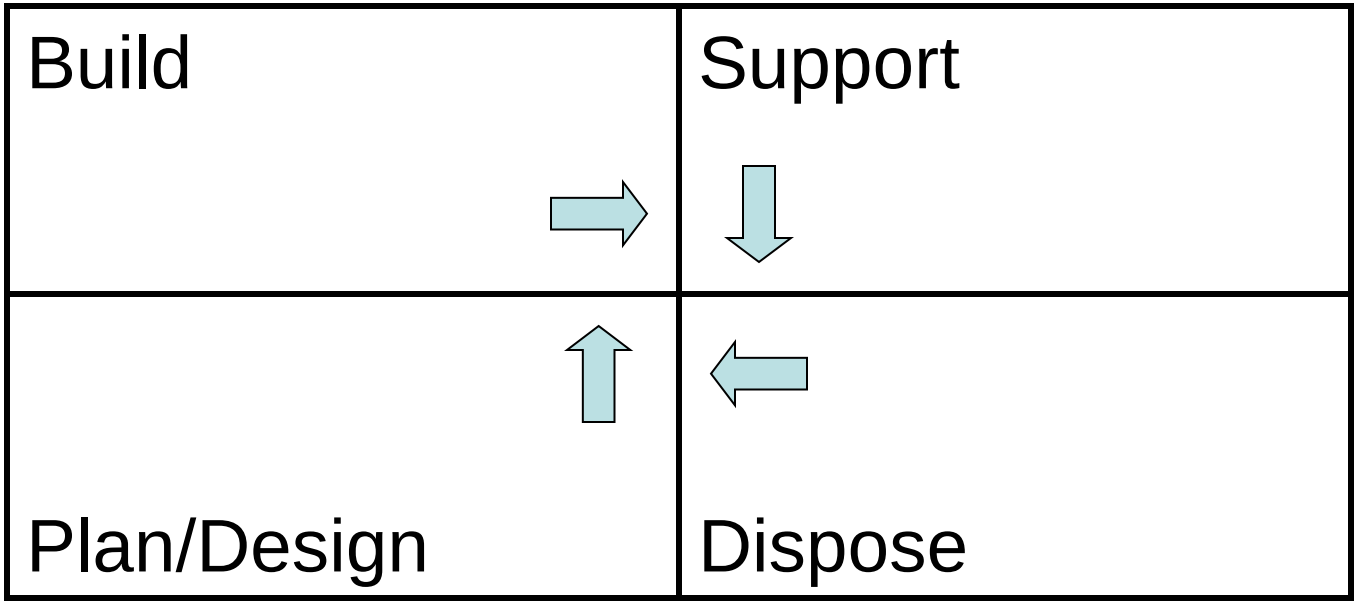
Product's Lifecycle



Information Characteristics About a Product/Process

- Singularity – unique and controlling version of the information
- Correspondence – link between actual and virtual representation
- Cohesion – integration of various views/schematics/descriptions
- Traceability – chronological ordering of all documents through time
- Reflectivity – changes in virtual representation reflect actual changes and vice-a-versa
- Cued Availability – having the right information available when needed

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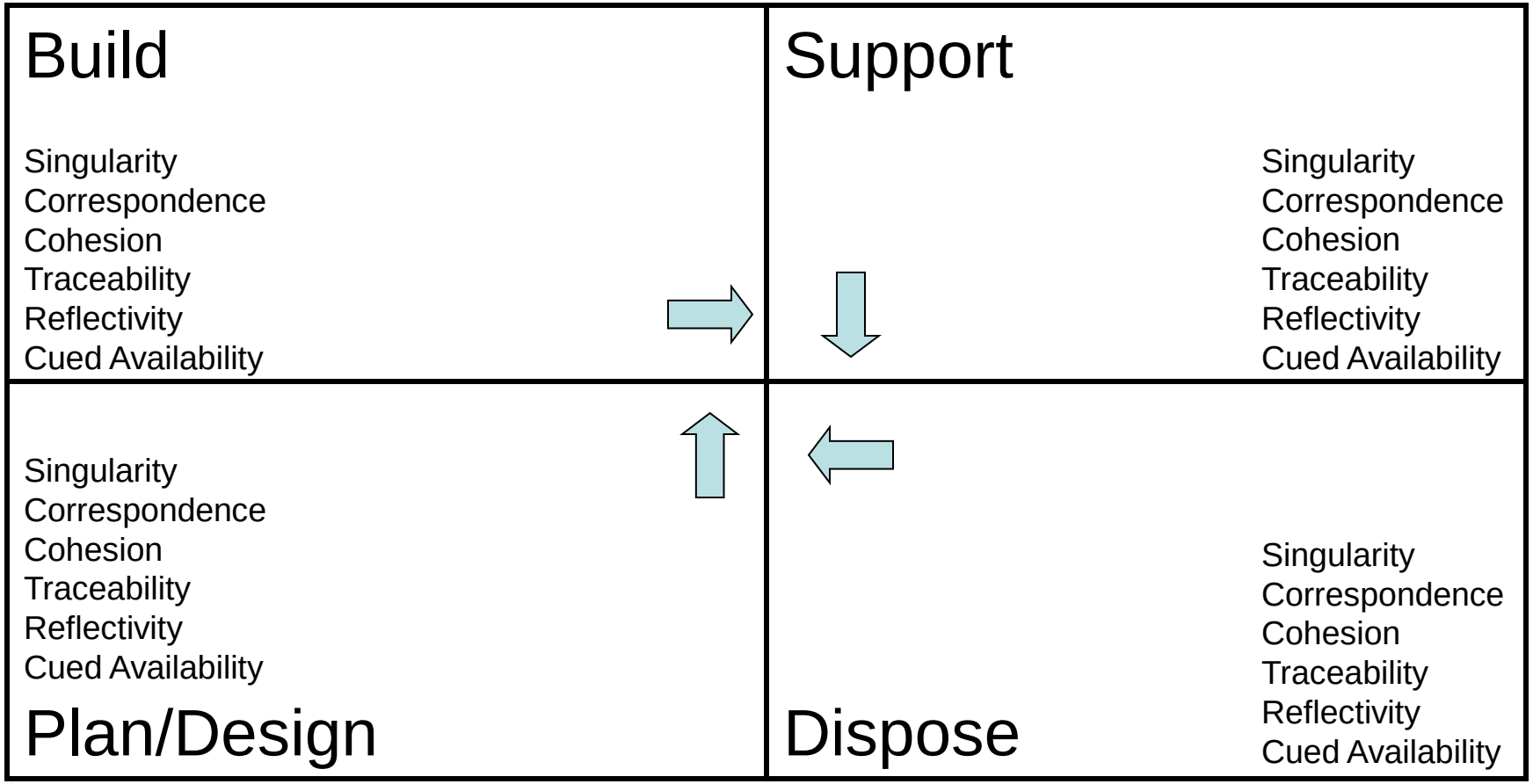
Information Characteristics Reflected in PLM Metrics



Grieves, M., *Product Lifecycle Management: Driving the Next Generation of Lean Thinking* The McGraw-Hill Co., Inc. New York, 2006, pp 65.

Waste Reduction Framework (per phase)

PLM Elements / Waste/Reallocation Components	People	Process/Practices	Technology
Time			
Energy			
Materials			

Plan/Design Phase
Waste Reduction Metrics

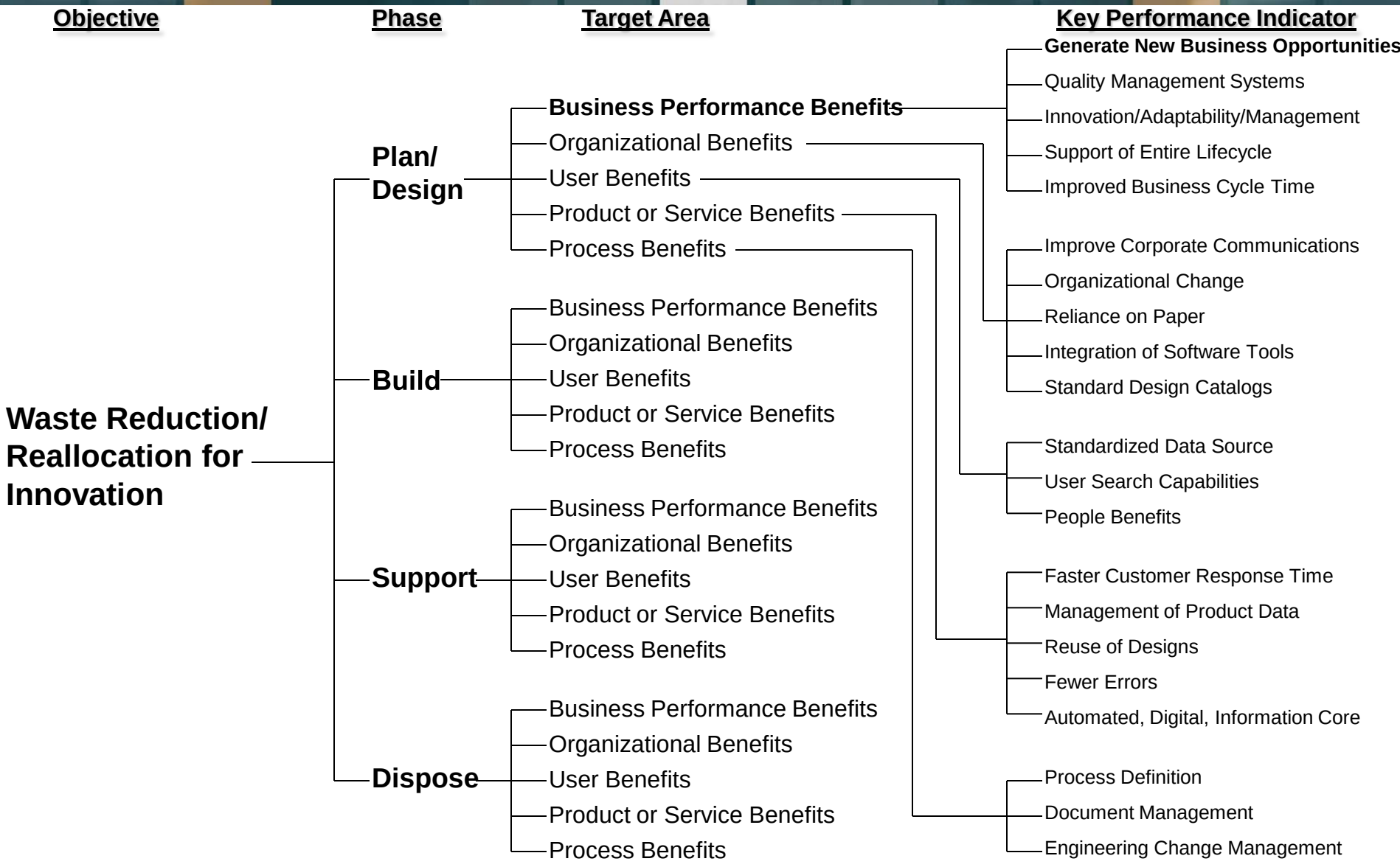
PLM Elements / Waste Components	People	Process/Practices	Technology
Time	• Time to locate information	• Number of times designs are reused	
Energy	• Amount of energy used to support face to face meetings	• Amount of energy required to sustain a manufacturing line	• Amount of energy spent in distribution of parts to sub-assemblies
Materials		• Amount of inventory	• Number of times raw material is delivered correctly

Innovation Framework (per phase)

PLM Elements / Innovation Components	Product	Process
Functionality		
Quality		

Plan/Design Phase Innovation Metrics

PLM Elements / Innovation Components	Product	Process
Functionality	• Number of new features	• Improved process capabilities
Quality	• Improved quality • Number of and costs of warranty problems • Number and costs of liability problems	• Better Quality Management Systems


Objective
Phase
Target Area
Key Performance Indicator
Waste Reduction/ Reallocation for Innovation
Plan/ Design
Business Performance Benefits
Organizational Benefits
User Benefits
Product or Service Benefits
Process Benefits
Build
Business Performance Benefits
Organizational Benefits
User Benefits
Product or Service Benefits
Process Benefits
Support
Business Performance Benefits
Organizational Benefits
User Benefits
Product or Service Benefits
Process Benefits
Dispose
Business Performance Benefits
Organizational Benefits
User Benefits
Product or Service Benefits
Process Benefits
Generate New Business Opportunities
Quality Management Systems
Innovation/Adaptability/Management
Support of Entire Lifecycle
Improved Business Cycle Time
Improve Corporate Communications
Organizational Change
Reliance on Paper
Integration of Software Tools
Standard Design Catalogs
Standardized Data Source
User Search Capabilities
People Benefits
Faster Customer Response Time
Management of Product Data
Reuse of Designs
Fewer Errors
Automated, Digital, Information Core
Process Definition
Document Management
Engineering Change Management

Phase	Target Area	Key Performance Indicator	Metric
Plan/ Design	**Business Performance Benefits**	**Generate New Business Opportunities**	**Number of RFPs responded to**
			Number of RFPs awarded
			Customer response time
			Number of new customers captured by new product support
			Improved Business Cycle Time
			Revenue growth
			Market share
			Number of new customers captured By new products
			Product price paid by customers
			Premiums due to being first-to-market
			Margins
			Number of purchases due to being first-to-market
			Market capitalization
		Quality Management Systems	
		Innovation/Adaptability/Management	
		Support of Entire Lifecycle	
		Improved Business Cycle Time	
	Organizational Benefits		
	User Benefits		
	Product or Service Benefits		
	Process Benefits		

Summary
Past, Present, Future

- **Past**
  - Reviewed PLM Literature
  - Conducted Focus Groups
  - Interviewed Industry Experts
  - Developed PLM Assessment Model
  - Developed PLM Framework

- **Present**
  - Creating Metric Model
  - Identifying Metrics
  - Creating Self-Assessment Metric Survey
  - Testing and Revising Metric Survey

- **Future**
  - Conduct Survey Assessment
  - Data Analysis
  - Case Study Results and Conclusions
  - Publications, grants, consulting
  - Develop Diagnostic Tool

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