



Enabling Lean Enterprise Transformation Through IT The PDM Example

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March 23, 2005 – LAI Plenary



Overview

- Context
- Research Design
- Results
- Implications for Lean
- Lessons Learned
- Conclusions



Lean Enterprise

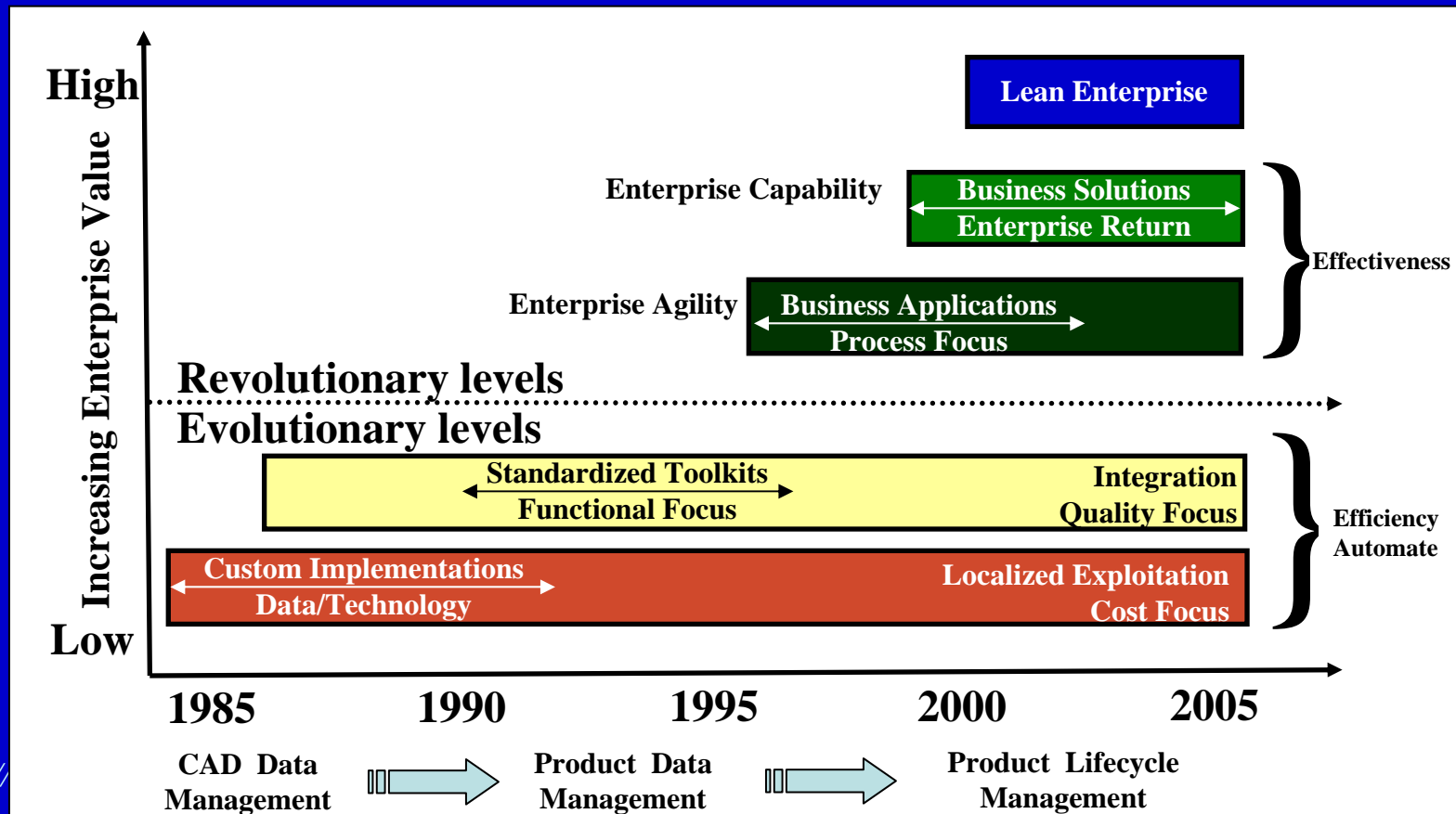
“A lean enterprise is an entity that efficiently and effectively creates value for its multiple stakeholders by employing lean principles and practices” — EA Working Group Definition

- Lean Principles
 - Waste minimization
 - Responsiveness to change
 - Right thing at right place at right time and in the right quantity
 - Effective relationships within the value stream
 - Continuous improvement
 - Quality from the beginning

Product Lifecycle Management

“A strategic business approach that applies a consistent set of business solutions in the support of the collaborative creation, management, dissemination, and use of product definition information across the extended enterprise from concept to end of life – integrating people, process, business systems and information (emphasis added)”

– CIMdata definition of Product Lifecycle Management



“Industry” Perspective

“The aerospace companies want to shed IT silos that can’t talk to each other, and the vendors want to accommodate them with suites of tools that can smoothly exchange data...”

– David Hughes, AWST, 2003

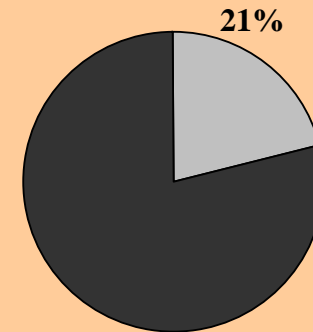
“PLM is an emerging technology with a lot of growth in front of it. But it is mature enough that the GMs of the world are using it and that’s a confidence-building factor”

– Bob Nierman, EDS

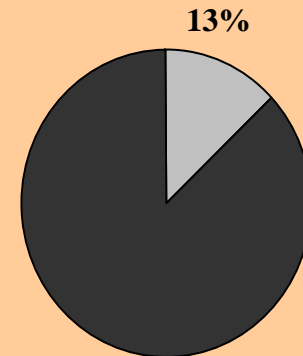
PDM/PLM technologies for aerospace alone is an estimated \$10.4 Billion market for 2005

– Daratech Report

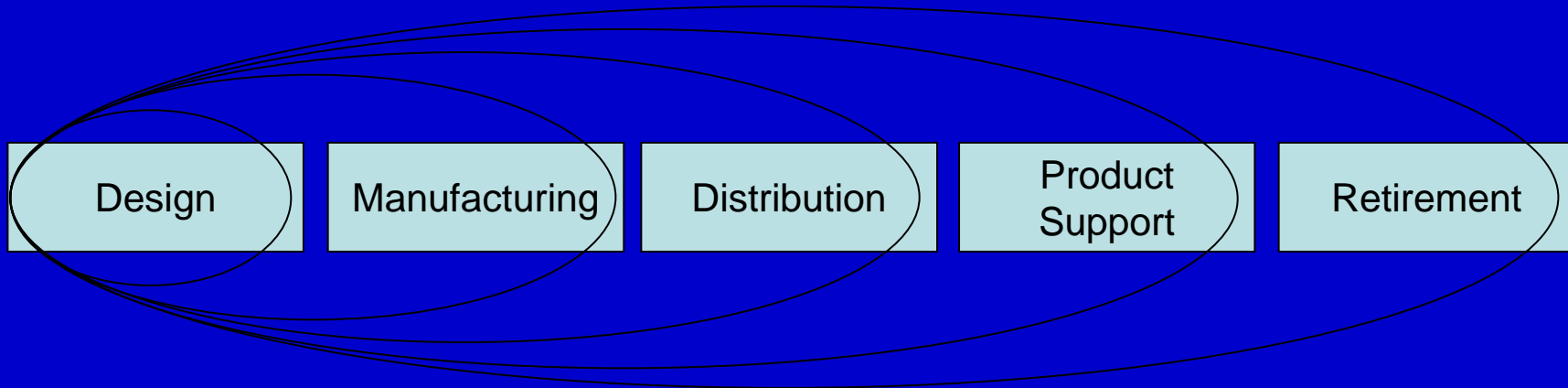
Aerospace Market Share of PDM/PLM
early 1990s



Aerospace Market Share of PDM/PLM
2005



The Real Value of PDM (beyond the design cycle)



- Why don't we know the realistic payback? The metrics aren't there!!
- The Intangibles
 - Downstream support capability and benefits
 - Contracts won due to capability
 - Actual savings due to reduced rework



Key Research Questions

- What are the high level requirements of a PDM?
- How is the management of data evolving?
- What makes a successful implementation?
- How are the technology and organization evolving? Who is driving?

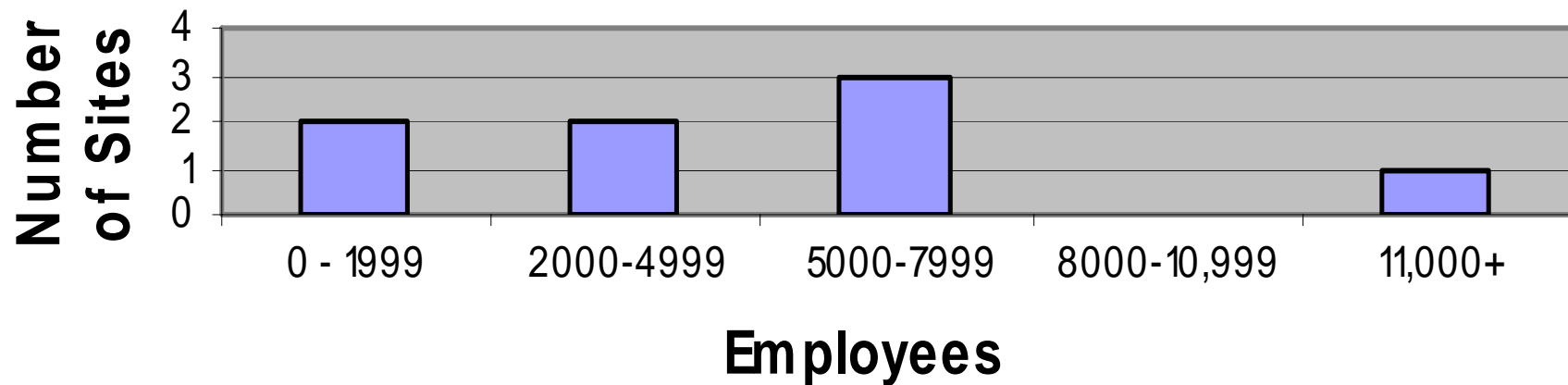
Research Methodology

- 9 Sites (6 Companies)
 - 24 programs
- Structured Interviews
 - Introduction to site
 - Site interview
 - Program interviews
 - Process interview
- Case Studies
 - 2 sites



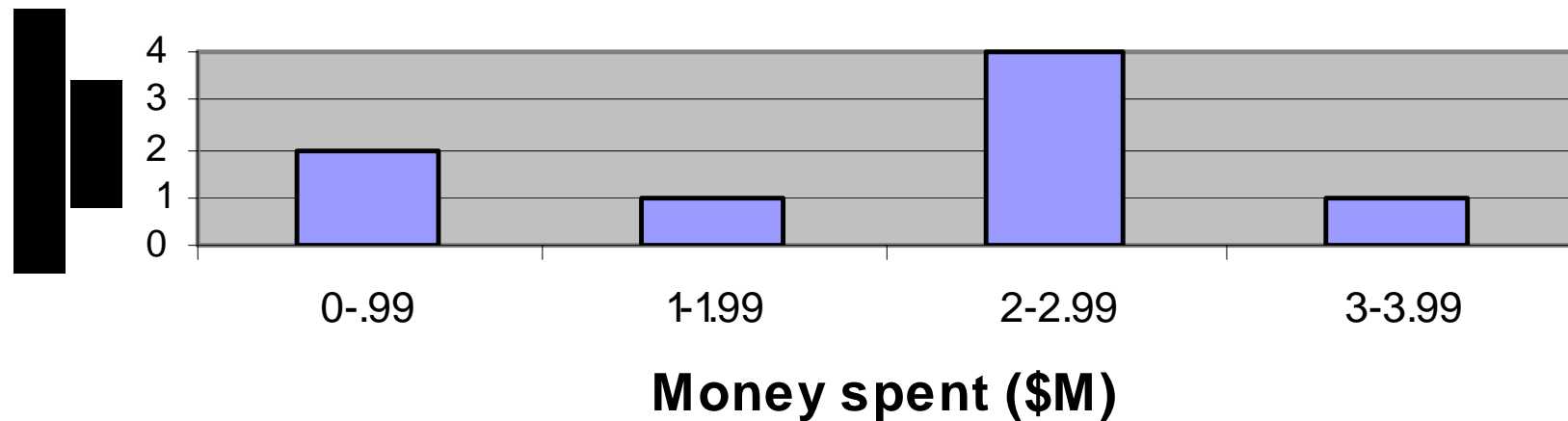
Site Profile Data (1)

Number of Employees at each Site



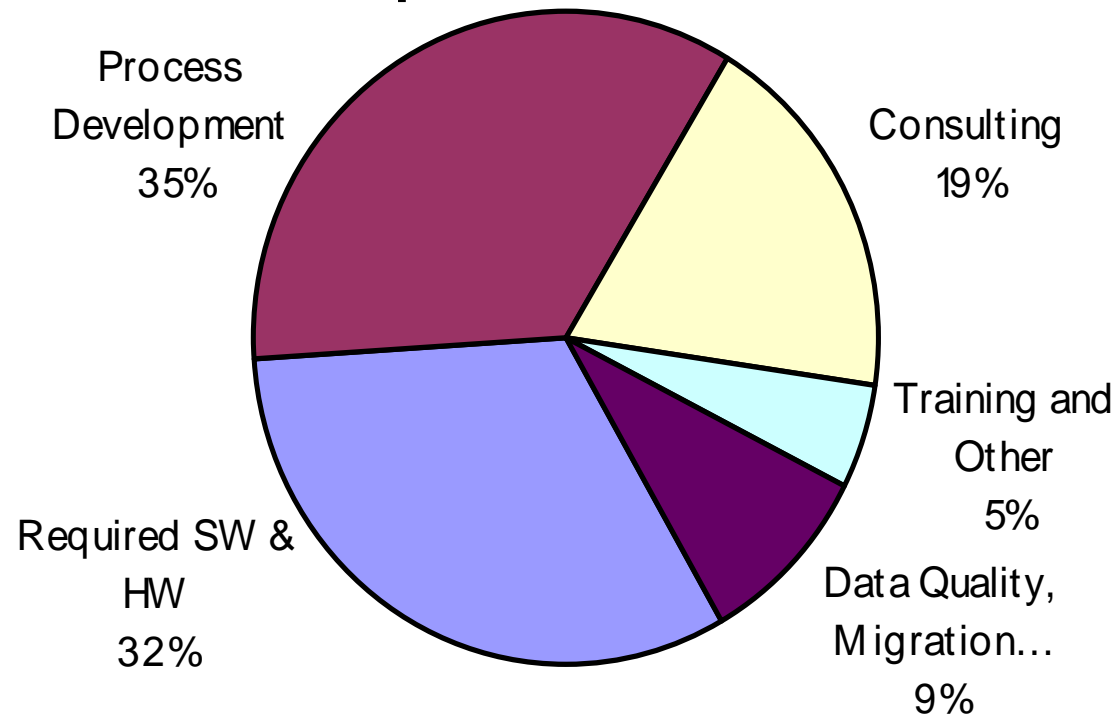
Site Profile Data (2)

Money Spent per Site per Year on PDM



PDM Implementation Spending

Where Money is Being Spent for PDM Implementations



- The majority of money spent is on developing processes and the licensing costs



Your Reasons for PDM

- Need to replace legacy tool(s)
- Reduction in cost, time to market
- Centralization of data
- Elimination of data redundancy
- Concurrent engineering
- Reduction in tool variability
- Efficiency gains in design, iterations



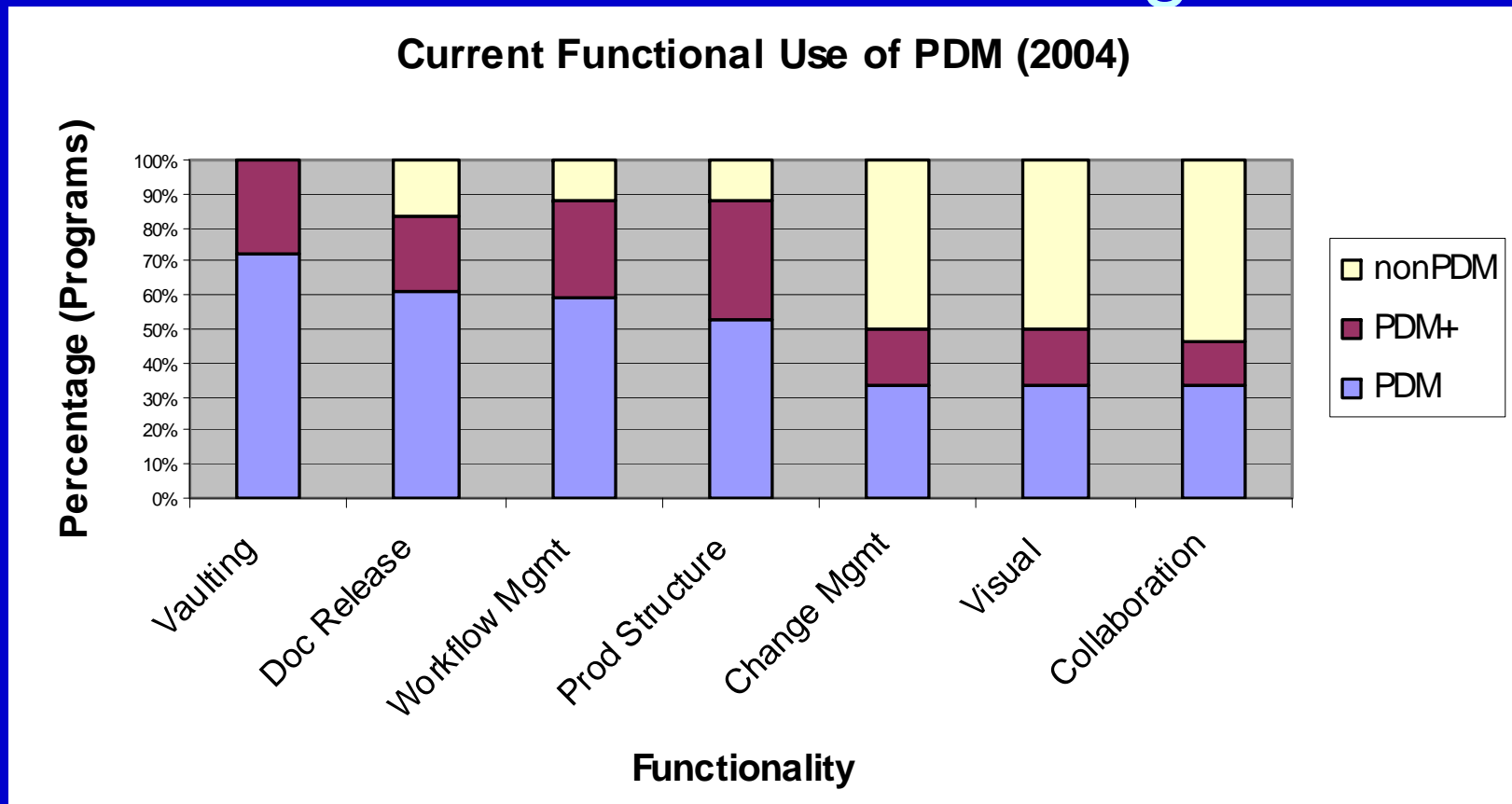
Primary Driver for PDM

- Site interviewees given a choice between:
 - Internal Need/Desire
 - Supplier Demand
 - Customer Demand
 - Competitive Need
- Survey says:
 - Internal: 7 responses
 - one had Customer as close second
 - Competitive: 2 responses
 - one had Internal as close second



Results from Site/Program Visits

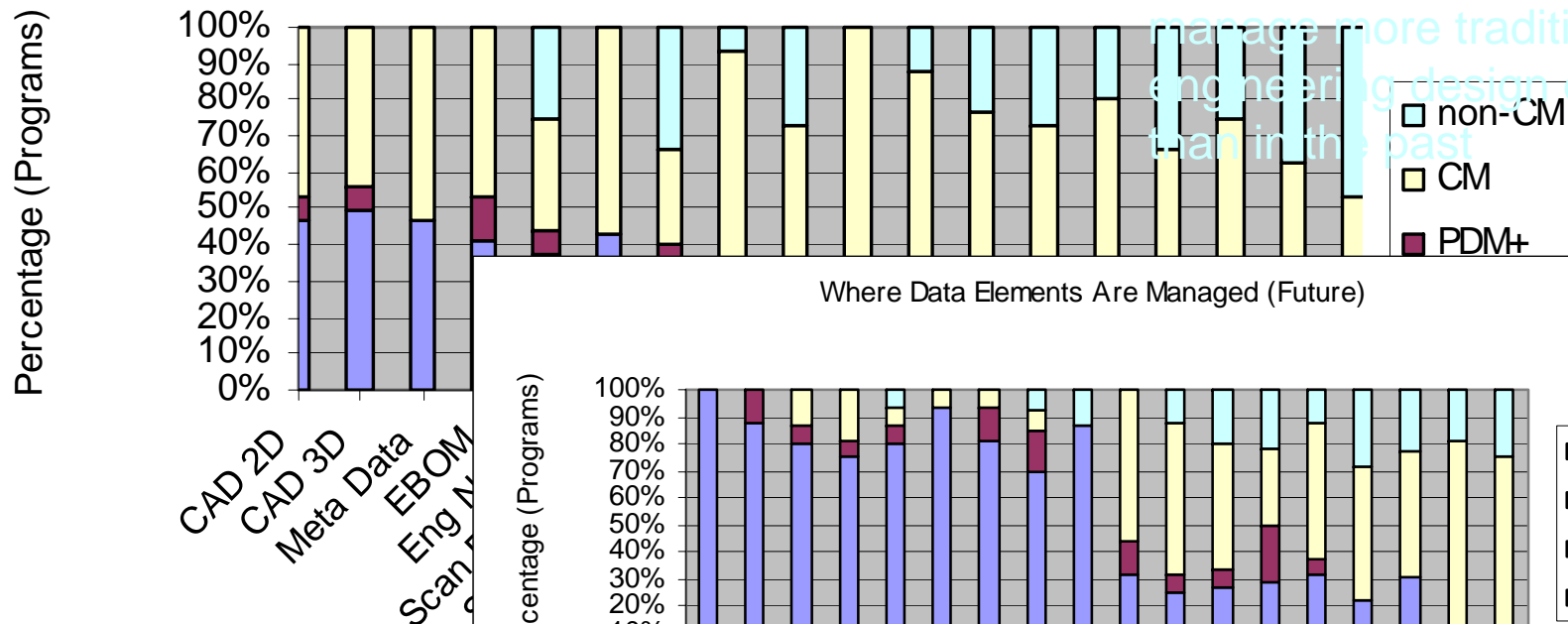
Results (1): What PDM is Being Used For



- There is a clear distinction between the traditional applications of PDM and those that are not

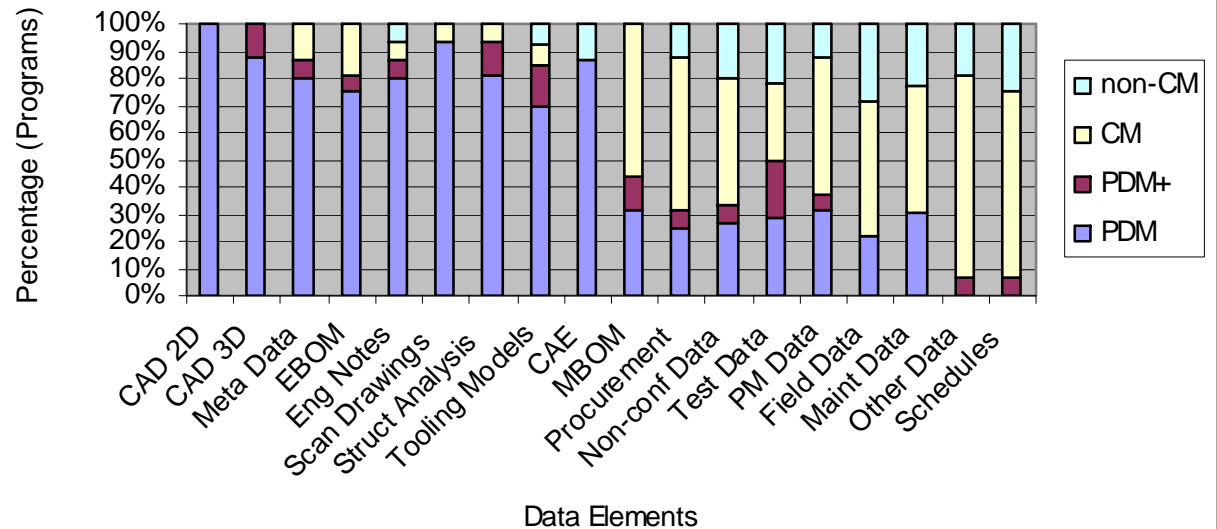
Results (2): Product Data Trend

Where Data Elements Are Managed (Past)



There is an industry trend in using PDM to manage more traditional engineering design data than in the past

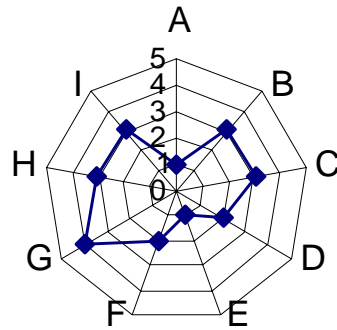
Where Data Elements Are Managed (Future)



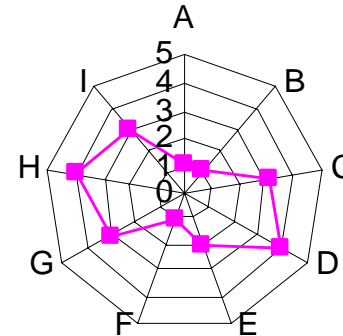
- MBOM is the breaking point due to other business systems

Results (3): PDM Maturity Survey

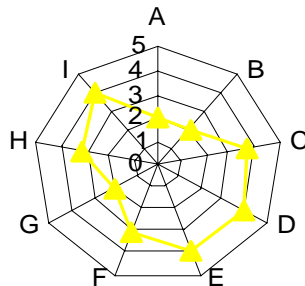
Integration of Product Data Across the Lifecycle



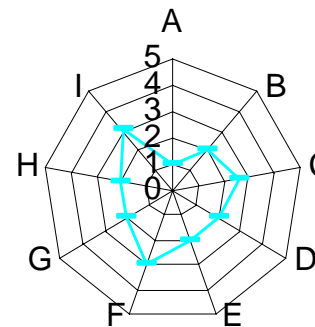
Extent of Supplier/Partner Integration



Management of Workflow Electronically Throughout the Lifecycle

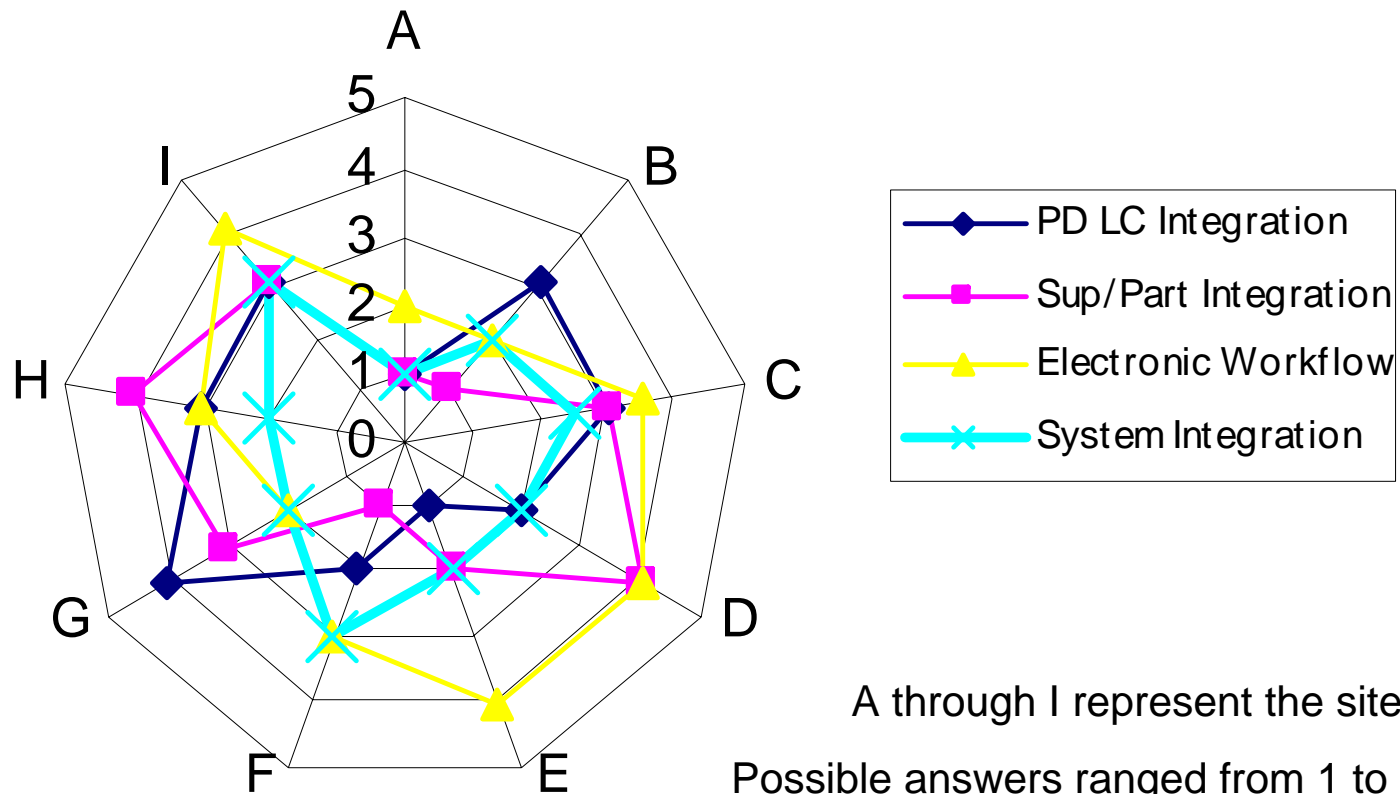


Integration/Compatibility with Existing Systems/Applications



Results (4): Industry's PDM Maturity

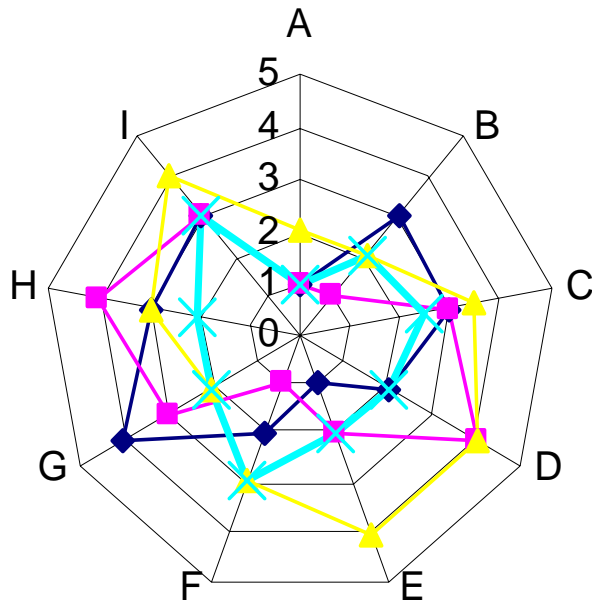
Results from Survey of PDM Maturity (Current)



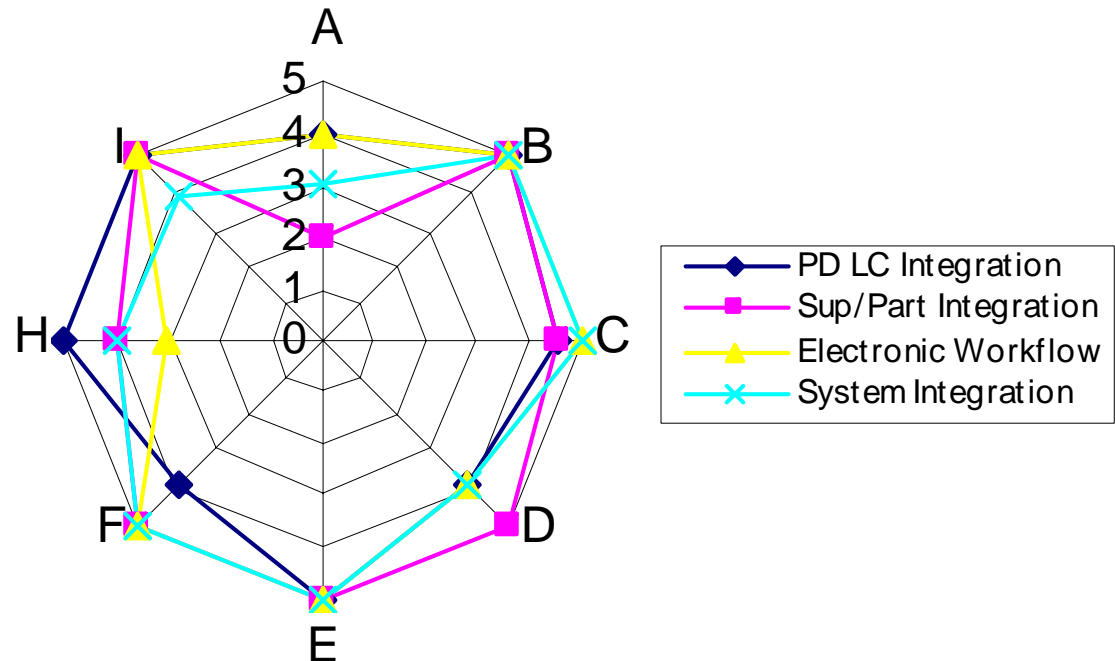
- Higher maturity lies in the primes, with similar capability in homogeneous suppliers

Results (5): Industry's Desired PDM Maturity

Results from Survey of PDM Maturity (Current)



Results from Survey of PDM Maturity (Desired)



- The desire to increase PDM capability demonstrates that companies are still striving to transform

Lean and PDM



Lean Practices

- 8 out of 9 sites employ Lean and some form of Six Sigma practices
- Was a Lessons Learned Standard Process used for the PDM implementation?
 - 2 out of 9 had a formal process
 - 5 out of 9 had an informal process
 - 8 of 9 have utilized LL information
- Stakeholder Identification
 - 3 out of 6 formally identified stakeholders and value



Lean Implications of PDM

- IT provides the infrastructure to support “Enterprise Change.”
 - PDM is a (important) piece of that.
- Creates opportunity to address process development/improvement
- When deployed as a Lean Initiative/Project
 - Competition with other initiatives
 - User sensitivity to success of past Lean events
 - May garner more management support
 - Provides visibility outside of “IT”

Take-Aways



Lessons Learned

- Change Management: Users
 - People/culture are your biggest barrier
 - Do not allow users to continue with the old system
- Change Management: Leaders
 - RAA: Responsibility, Authority, Accountability
 - Clear Objectives/Staying Power
- Run it Like a Program
- Get the vendors involved early – understanding of process-tool interaction
- Understand vendor capability e.g. BOM management



Fun Quotes

“I guess it’s working just fine.”

~PDM Budget Oversight~

“There is no point in doing a value stream map and finding out where improvements can be made, if you do not have the authority and the funding to actually make changes”

~Director of Lean PDM~

“Everyone is into reducing waste and continuous improvement so it becomes the change agent – the common language we all speak to justify going to our (common) singular system.”

~VP of Engineering on Lean~

Conclusions

- PDM remains focused on the design stage
- Suppliers moving up the food chain: Need for product data management capability
- Change management and data migration are the biggest challenges/pitfalls
- Lean principles and practices should be used when implementing PDM capability
- PDM enables Lean Enterprise Transformation
 - opportunity to address enterprise value stream



Thank you

Questions? Feedback?

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