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Customer Success Is Our Mission

Driving Affordable Common Solutions with Mission Analysis

44th Annual NDIA Gun and Missile Systems Conference

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Burning Platform

Our customers needs are continually evolving, performance expectations grow while cost expectations drop.
To meet their needs, we must:

- Be Faster - *in development and to the field…*
  - Reduce time to concept demos
  - Reduce product development time (SDD)
- Be Cheaper – *in SDD and Life Cycle…*
  - Reduce total cost of ownership for customers
- Be Better – *continually address improved performance and…*
  - Increase the quality of our products
  - Provide extensible, adaptable, modifiable solutions to increase value to the customer

Technological innovation is only a part of the solution!

The Modularity Vision Described: "Be Key Enabler for Design 2010 Precepts"

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Understands The Use Of The Product

Makes Requirements Capability Trades Around Affordability

Determines The Manufacturing Strategy

Identifies Where To Buy From

Designs To Maximize This Strategy

Lean Innovation and Development

Modeling and Simulation

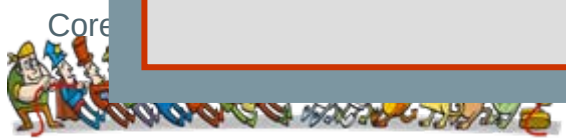
Manufacturing Technology

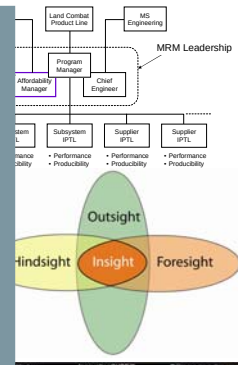
Supplier Integration

Affordability Manager

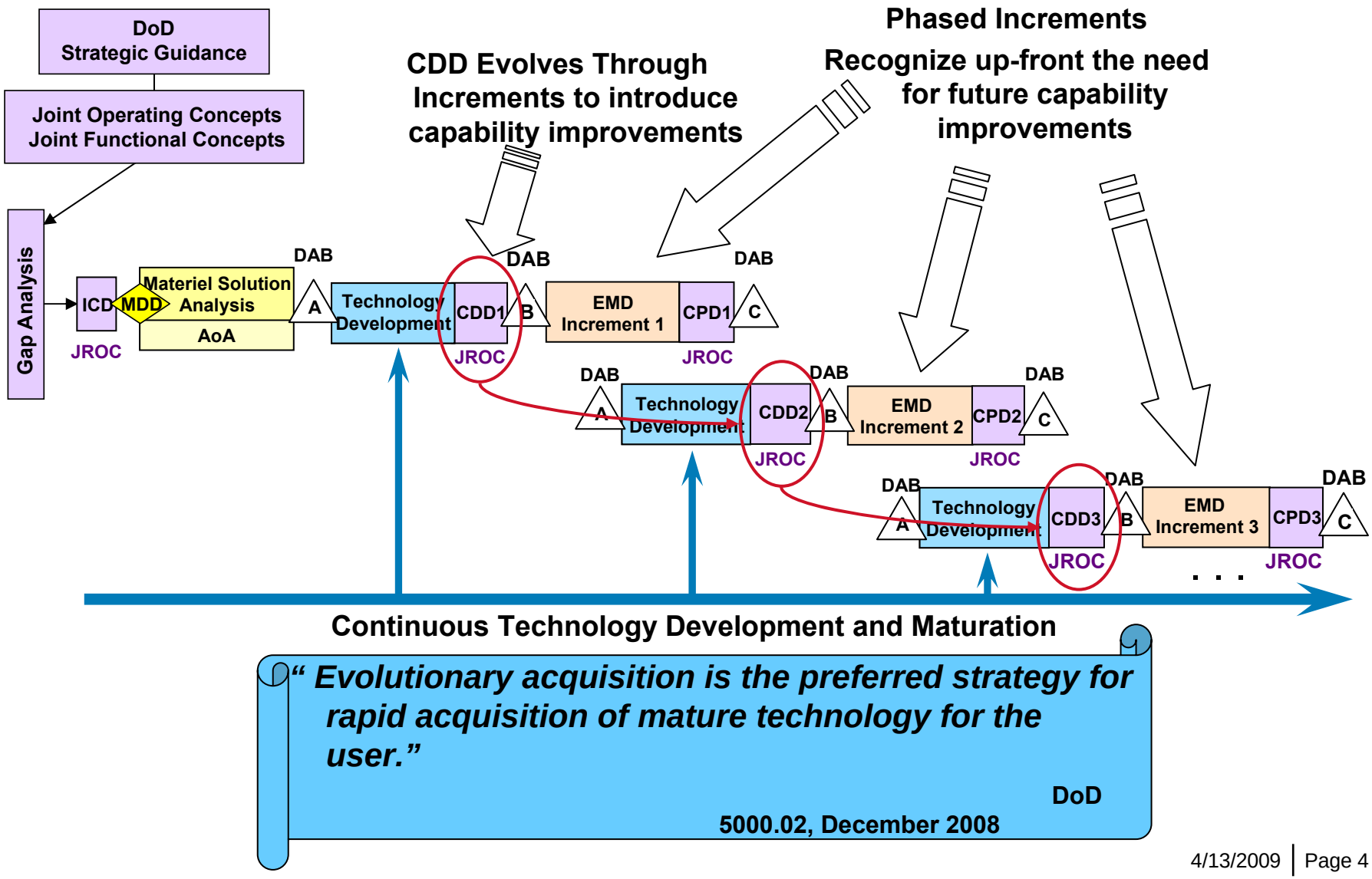
Workshops In Customer and to Define End and Identify T Values

- Create Platform for Usable Design Data
- Create Platform for "Agility"
- Create Model for True Lean Design
- Show High Level Integration into the Manufacturing and Supply Chain Architecture
- Platform for Lowest Cost Design of Product
- Be Model to Extend to other products!!





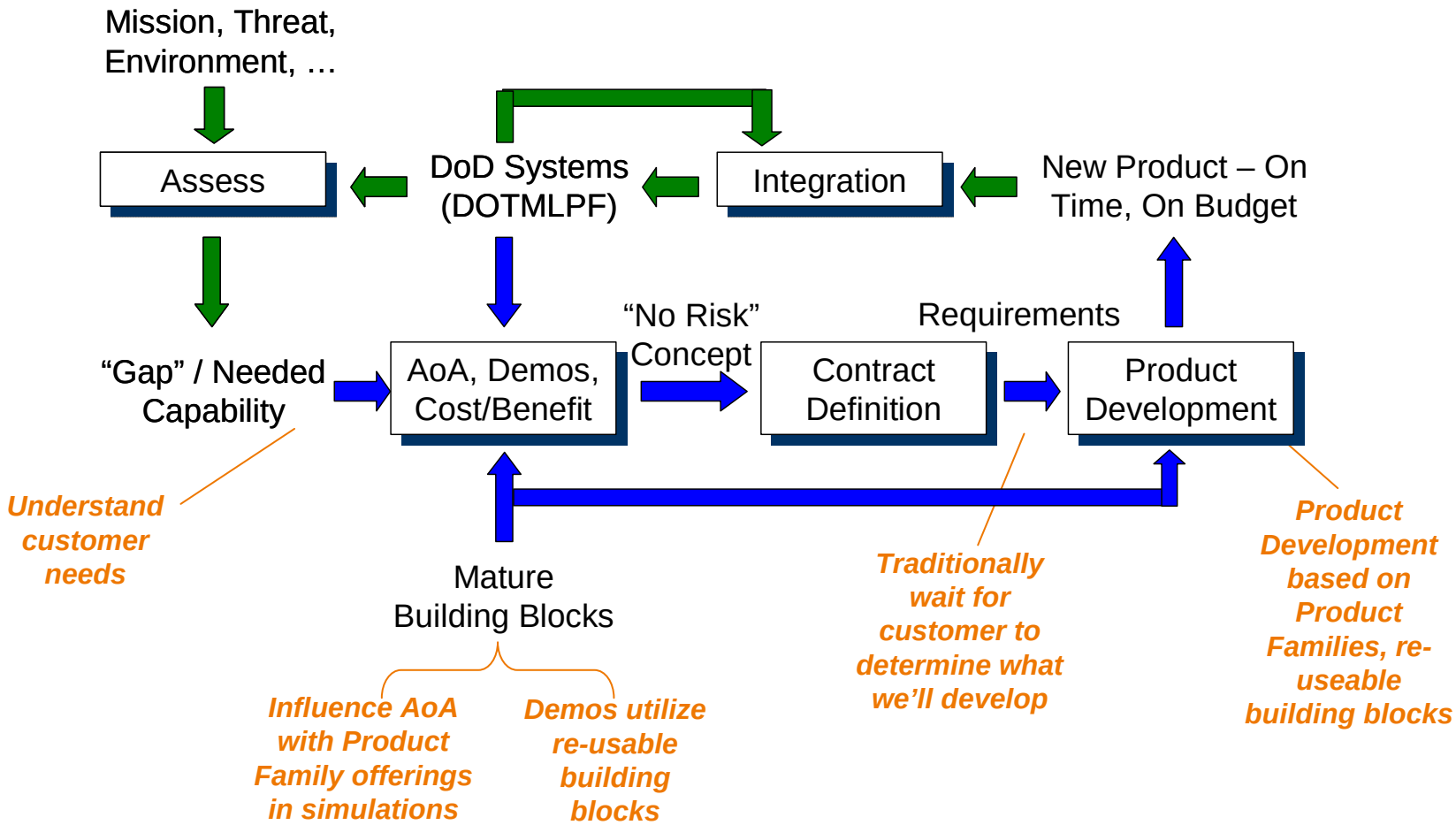
Evolutionary Acquisition – DoD 5000.2



> *" Evolutionary acquisition is the preferred strategy for rapid acquisition of mature technology for the user."*
>
> DoD
>
> 5000.02, December 2008

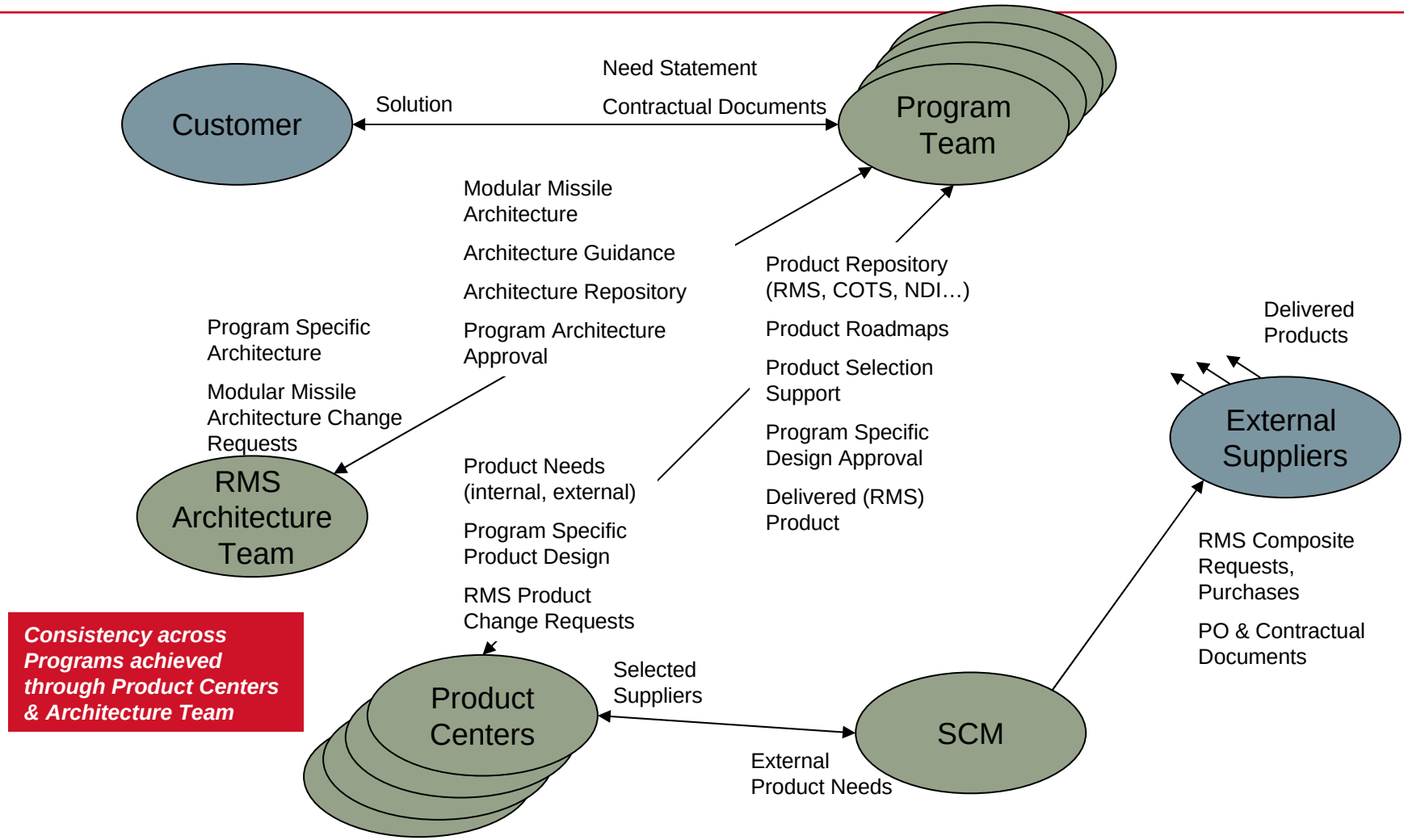
Modularity Vision Tied to Business Strategy

Capability-Based System Development



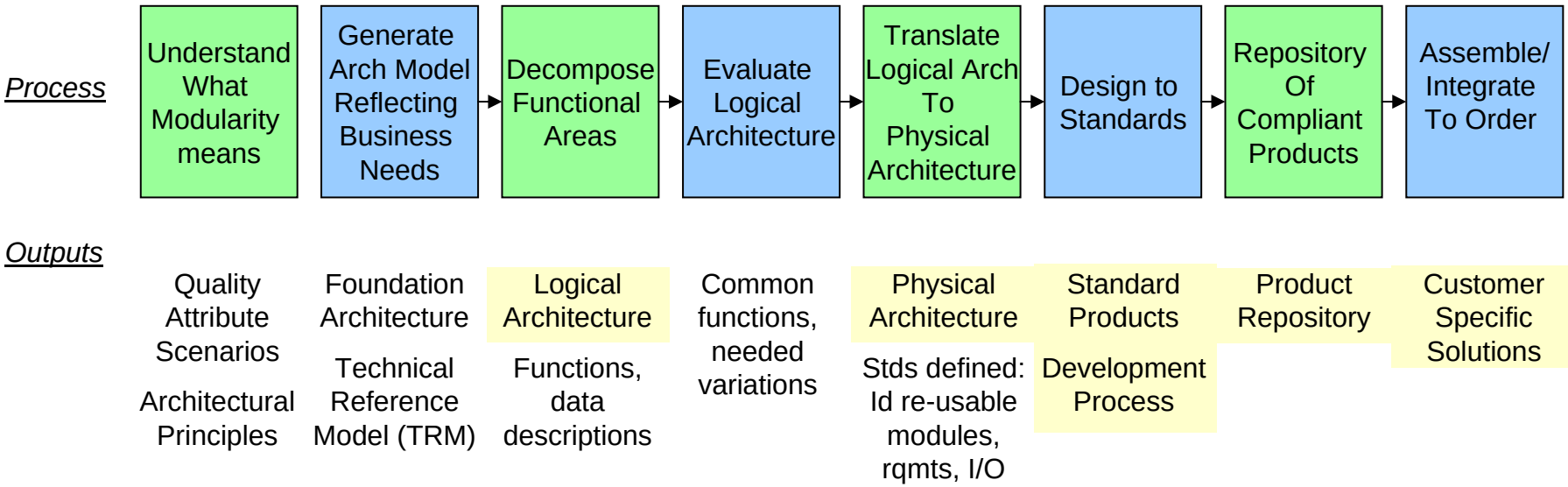
Modularity and Reuse are a comprehensive Product Strategy that support and influence the acquisition process through the use of simulations and demos

Notional Workflow – Missile Development



Product Family Architecture and Product Center Expertise enable faster delivery of affordable, high quality customer solutions

Modularity Process and Benefits



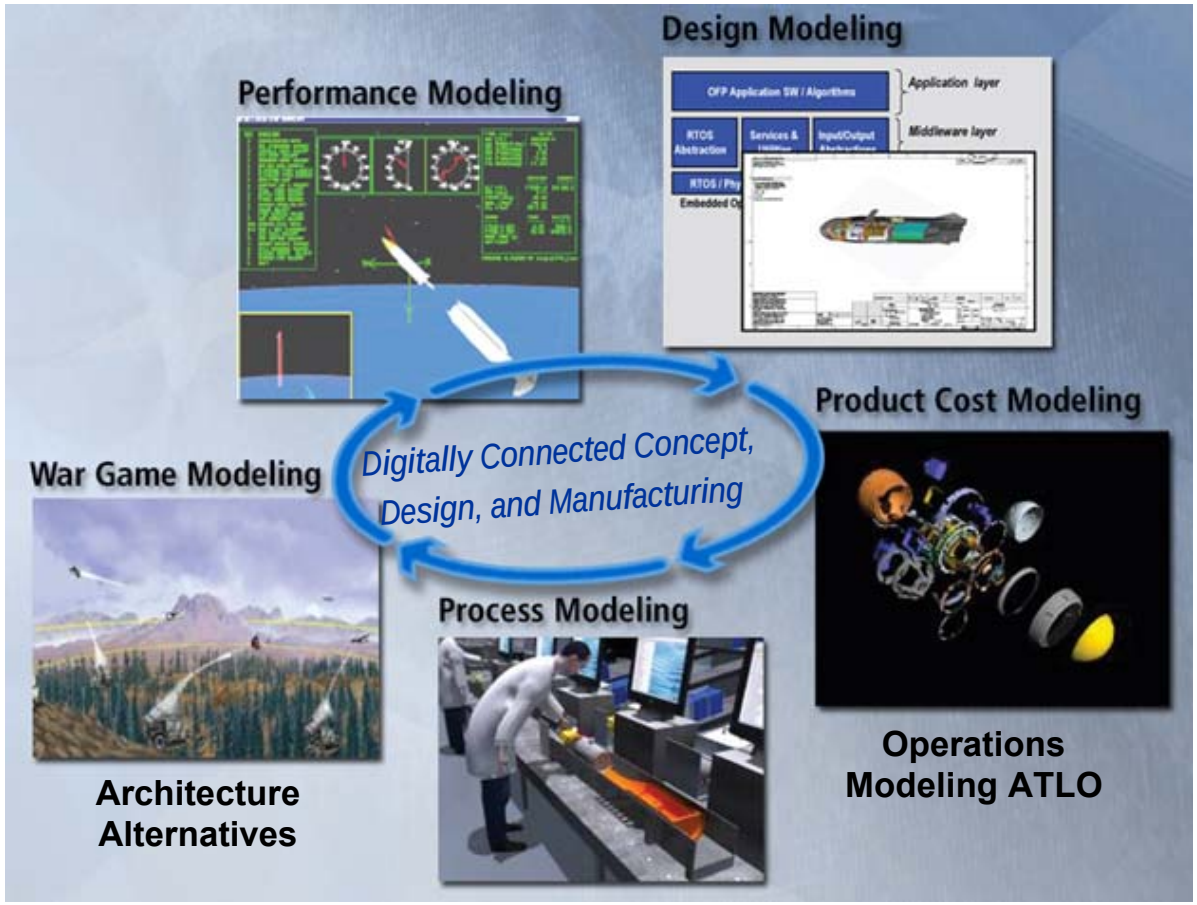
Benefits of using common architecture, reusable modules:

- Staffing flexibility- **allows staff to move easily from program to program (core set of modules and architecture looks same; only need to learn the program specific deltas)**
- Productivity increase **– low learning curve, easier to work multiple programs, learning transfers across programs**
- Predictability **– mature the modules, mature the process - enables more accurate estimates, performance prediction for people and products**
- Increased time for innovation **– reuse what's ordinary; be creative in specializing for customer, building new products from reusable product base**

Design 2010 – Changing the Paradigm

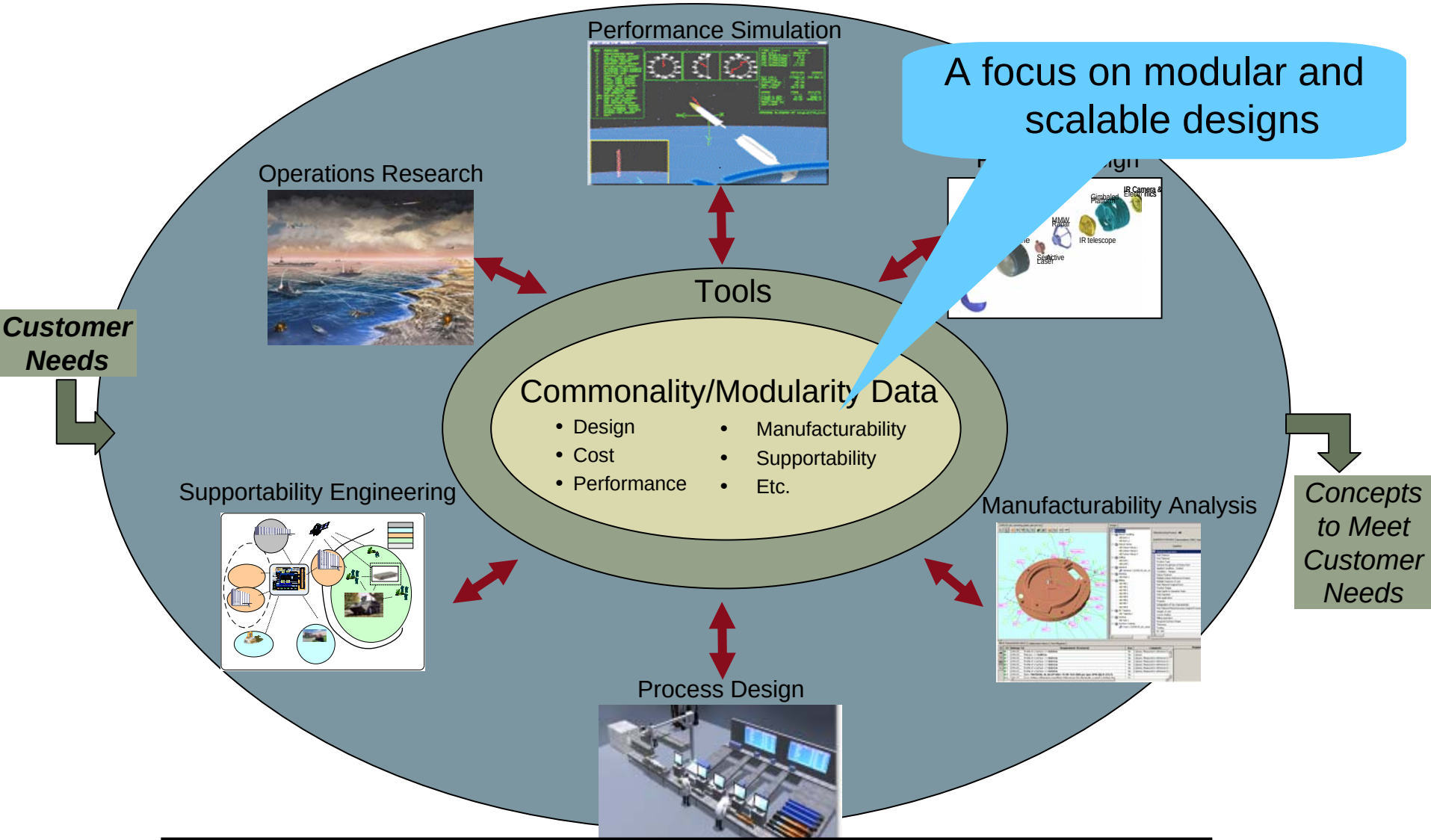
- Principles
  - Architecture Driven
    - Analysis of Alternatives
  - Model Driven
    - vs. Specification Driven
  - Rapid Prototype
    - Spiral Cycles – Virtual
    - 1st Hardware and SW
  - Lean Design Planning
    - Design Profit Day 1
  - End to End Solutions Studied
- Results (An Early Project)
  - Arch to Design Cycle 45 Days to Proto-type
  - Model-driven 6-DOF – Early
  - Design –Target Cost Model
  - Lean Design
    - Modeled/Design Profit
  - Design Cycle Improvement

Changing The Systems Design Perspective



Design 2010 VSD - Model Driven, Robust Architecture Based Solutions

VSD Operational View of Architecture (OV-1)



How We Bring Architecture Together!

VSD Link
Lean Architecting to Lean Design

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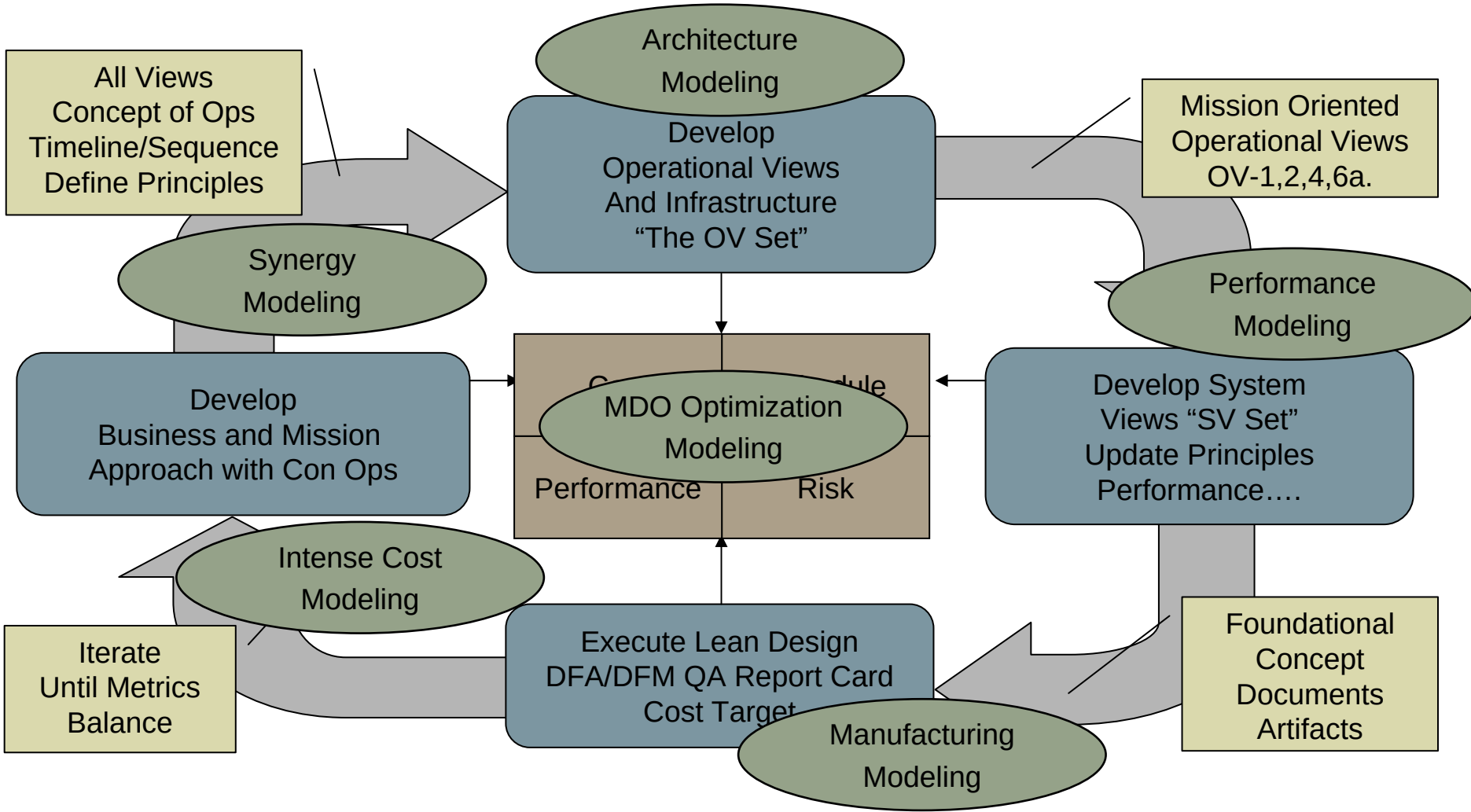


Foundational Approach to Lean Systems Design …
DoDAF and Zachman Methods

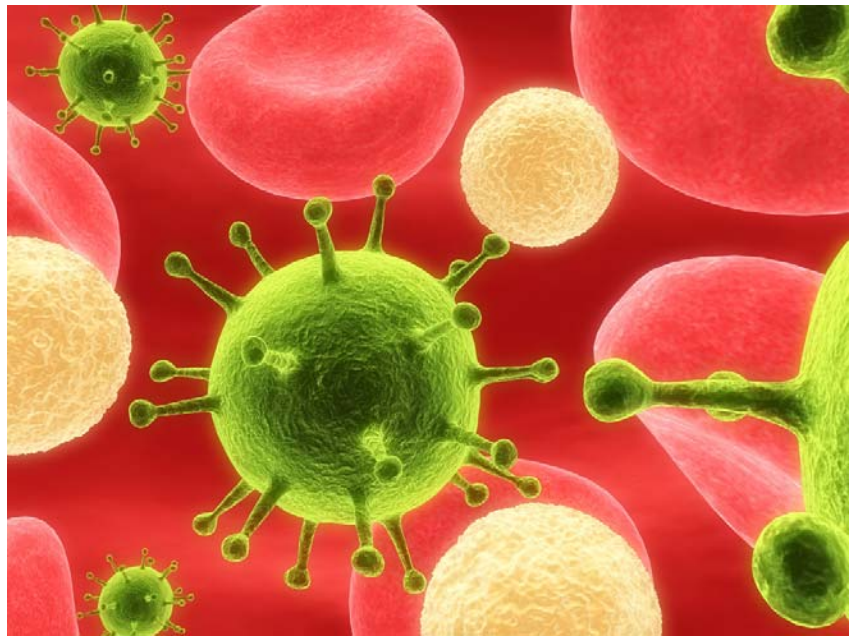
Cultural Obstacles to Lean Design and Reuse

- Engineering and production rework
- Linear Design
- Weak Systems Thinking
- Little Re-use of Previous Solutions – "Designer Preference/NIH"
- Weak "Outsight"
- Lack of Effective Collaboration
- Weak Management Support for Innovation
- Resistance to Changing Engineering Processes

Management Must Demand Design Reuse Or It Will Not Happen!

Systemic Obstacles to Lean Design and Reuse

- Defense Projects are “Cellular”
  - Designed to “stand alone”
  - Unique, inflexible specifications
  - Unique contractual requirements
  - Unique security/AT requirements
  - Difficulty in facility and capital equipment sharing
  - Inter-service differences
  - Intra-service differences
- Company & Government accounting systems geared for cellular structure



Greater Flexibility in Contracting and Specifications Development are needed to achieve higher levels of lean design and reuse

Summary

- Defense Customers are demanding that industry be *faster, cheaper, and better*
- Modularity and Reuse are key enablers for future systems
- Modularity and Reuse Benefits Everybody!
- Modularity and Reuse will not happen by themselves – it will take a concerted effort by Industry and Government