

Strategic Cross-Discipline Collaboration: A Foundation for Concurrent Product Development

Integrated Defense Systems
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6/8/06

Raytheon at a Glance

<http://www.raytheon.com>

Raytheon
Integrated Defense Systems



RAYTHEON AT A GLANCE

- Chairman and CEO: William H. Swanson
- Headquarters: 870 Winter Street Waltham, MA 02451-1449
The Waltham main switchboard number is 781.522.3000.
- 80,000 employees worldwide
- \$21.9 billion in 2005 sales

Raytheon is a global leader in technology-driven solutions that provide integrated mission systems for the critical defense and non-defense needs of our customers. Raytheon's integrated businesses assure mission success with a broad range of products and services in government electronics, space, information technology, technical services, business, aviation and special mission aircraft.



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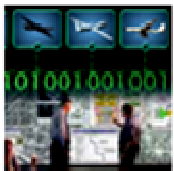


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Agenda

- Pillars of Concurrency — Establishing the Infrastructure
- Integrated Product Development Process (IPDP)
- Program Funding and Spend Profiles
- Strategic Cross-Discipline Collaboration
- Product Communities of Practice (CoPs)
 - Leverage Across the Business
 - Connecting Strategy With Subject Matter Experts
- Summary — Strategic Collaboration: Everybody Wins

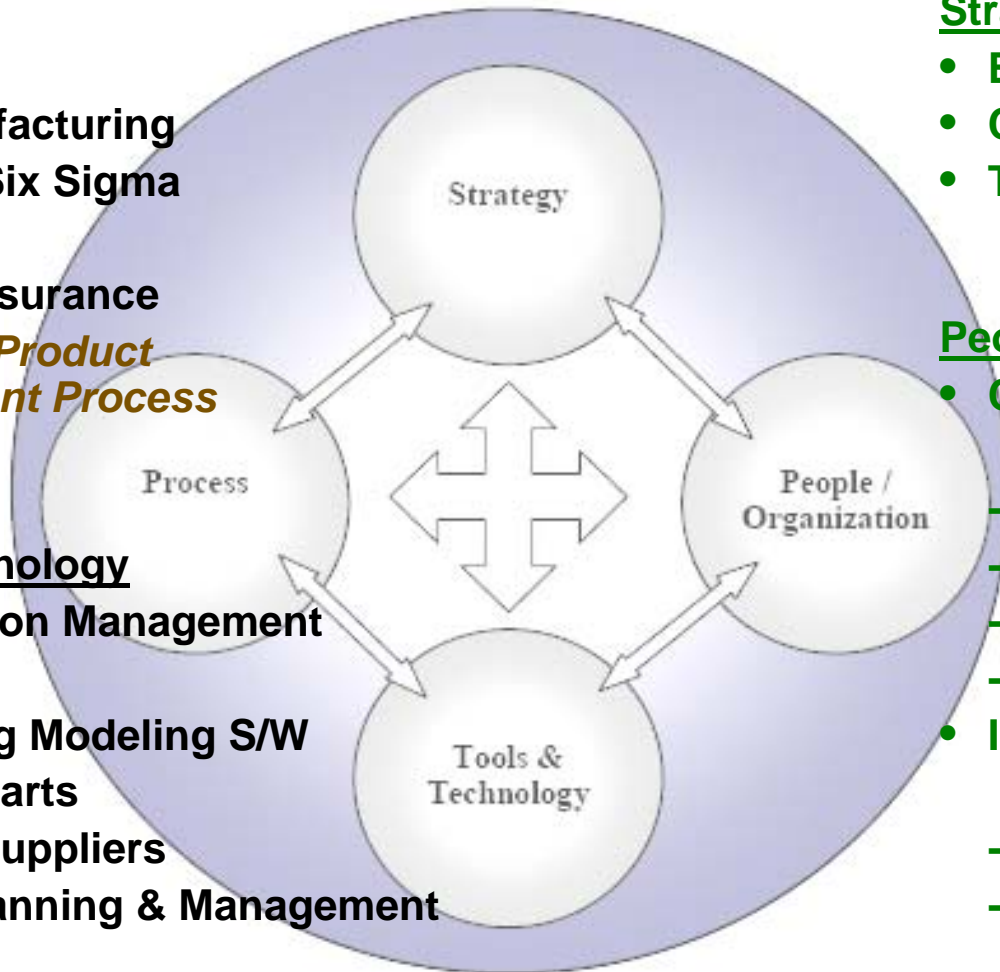
Pillars of Concurrency*

Process

- CMMI®
- Lean Manufacturing
- Raytheon Six Sigma
- AS-9100
- Mission Assurance
- *Integrated Product Development Process*

Tools & Technology

- Configuration Management
- CAD/CAM
- Engineering Modeling S/W
- Preferred Parts
- Preferred Suppliers
- Material Planning & Management



Strategy

- Business Plans
- Capital Investment
- Technology Roadmaps

People/Organization

- Cross-Business Teams (Functional)
 - Engineering
 - Operations
 - Integrated Supply Chain
 - Performance Excellence
- Integrated Business Teams (Program)
 - Missile Defense
 - Integrated Air Defense

Establishing the infrastructure ... is it enough?

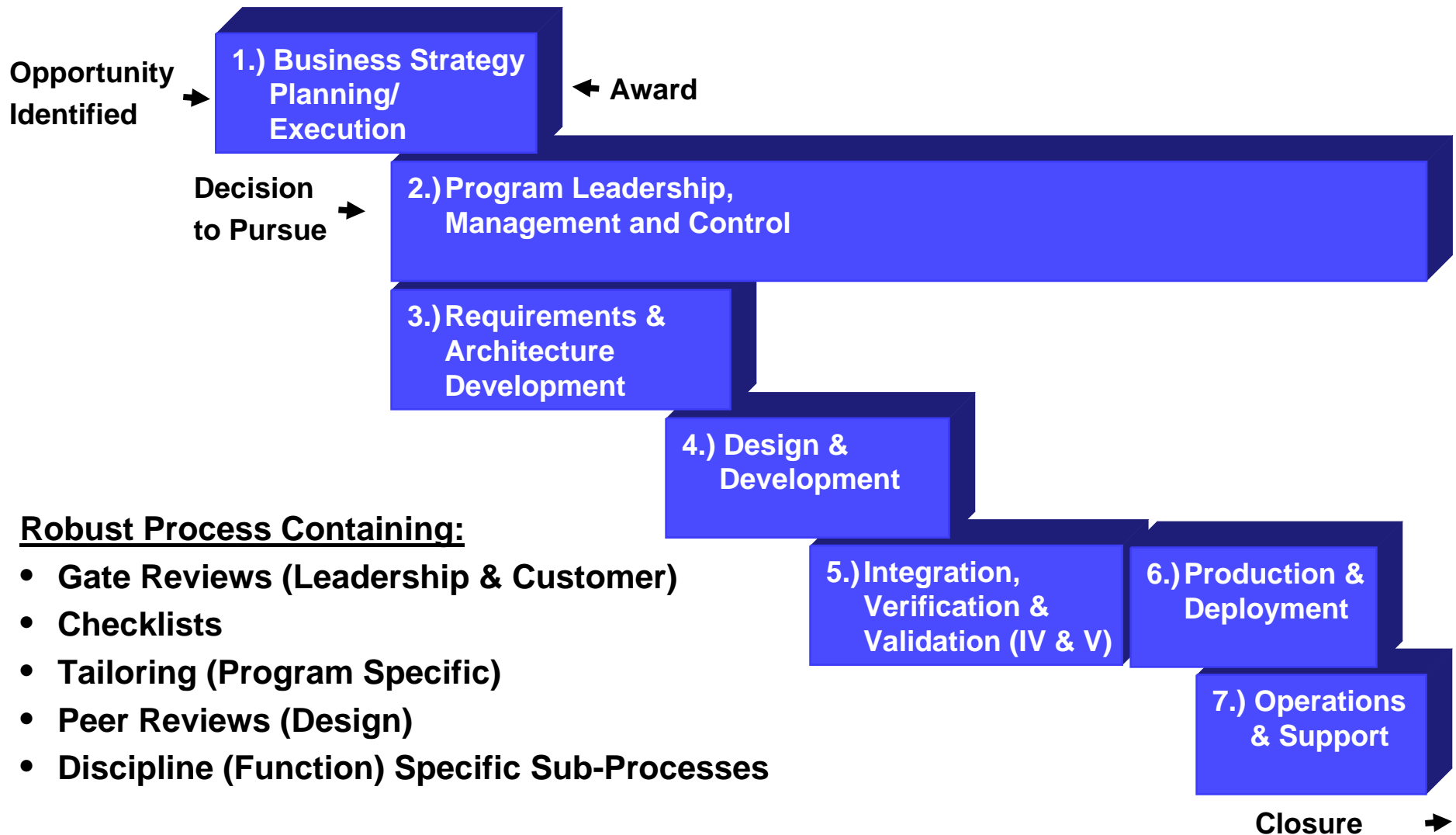
* Pillars of concurrency and diagram are used with verbal permission from Professor Frank Hull, Arizona State University and taken from *Concurrency Volume 14, Number 3, March 2006, SCPD: Integrating Strategy, People, Process, Tools, and Technology*, "PILLARS OF CONCURRENCY," by Frank Hull and Paul Collins, Page 9.

Integrated Product Development Process

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Typical *PROGRAM* Product Development Phases



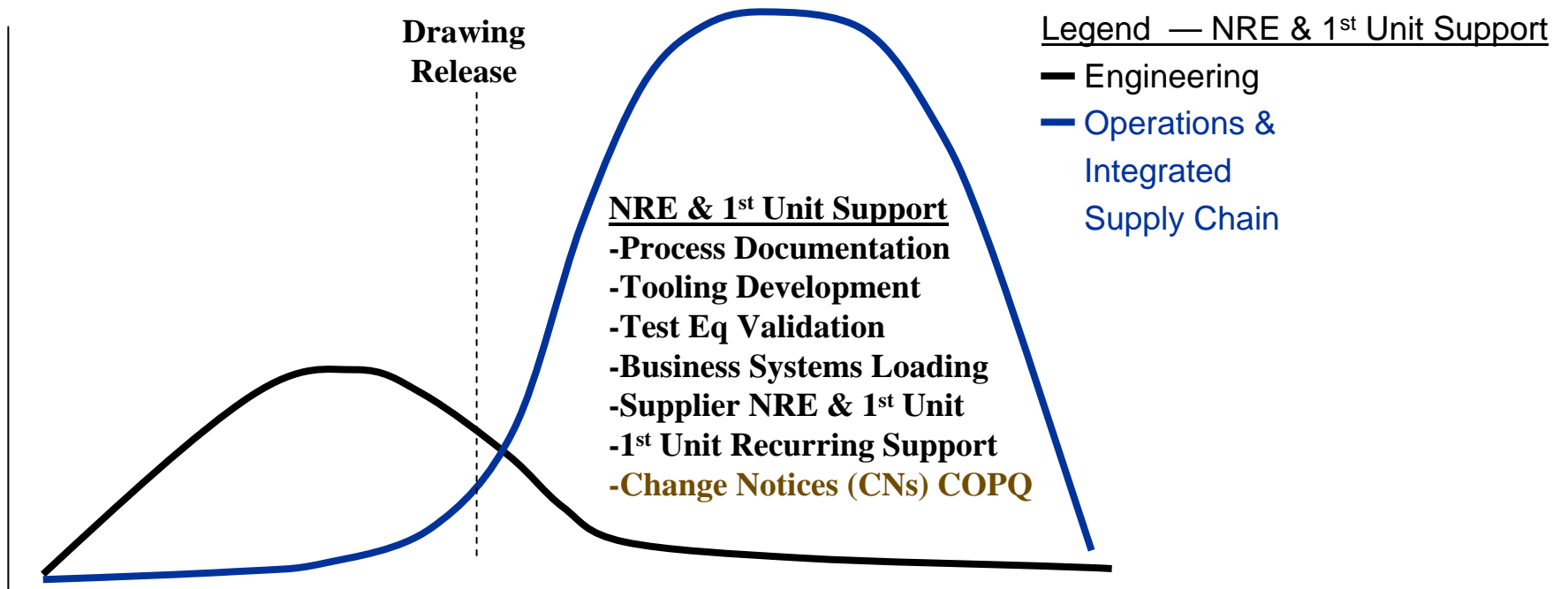
Robust Process Containing:

- Gate Reviews (Leadership & Customer)
- Checklists
- Tailoring (Program Specific)
- Peer Reviews (Design)
- Discipline (Function) Specific Sub-Processes

Where does Concurrent Product Development begin ???

Program NRE & First Unit Spend Profile

High-Mix, Low-Rate Defense Industry



■ Why this spend profile?

- High-mix, low-rate business
- Customer spend profile
- Not designed yet
- Suppliers not contracted yet
- Make/buy not defined
- Etc.

■ Undesirable effects impact customer satisfaction

- Late application of knowledge
- Knowledge not shared across IPTs
- Quality issues
- Product cost
- Cycle times longer
- Etc.

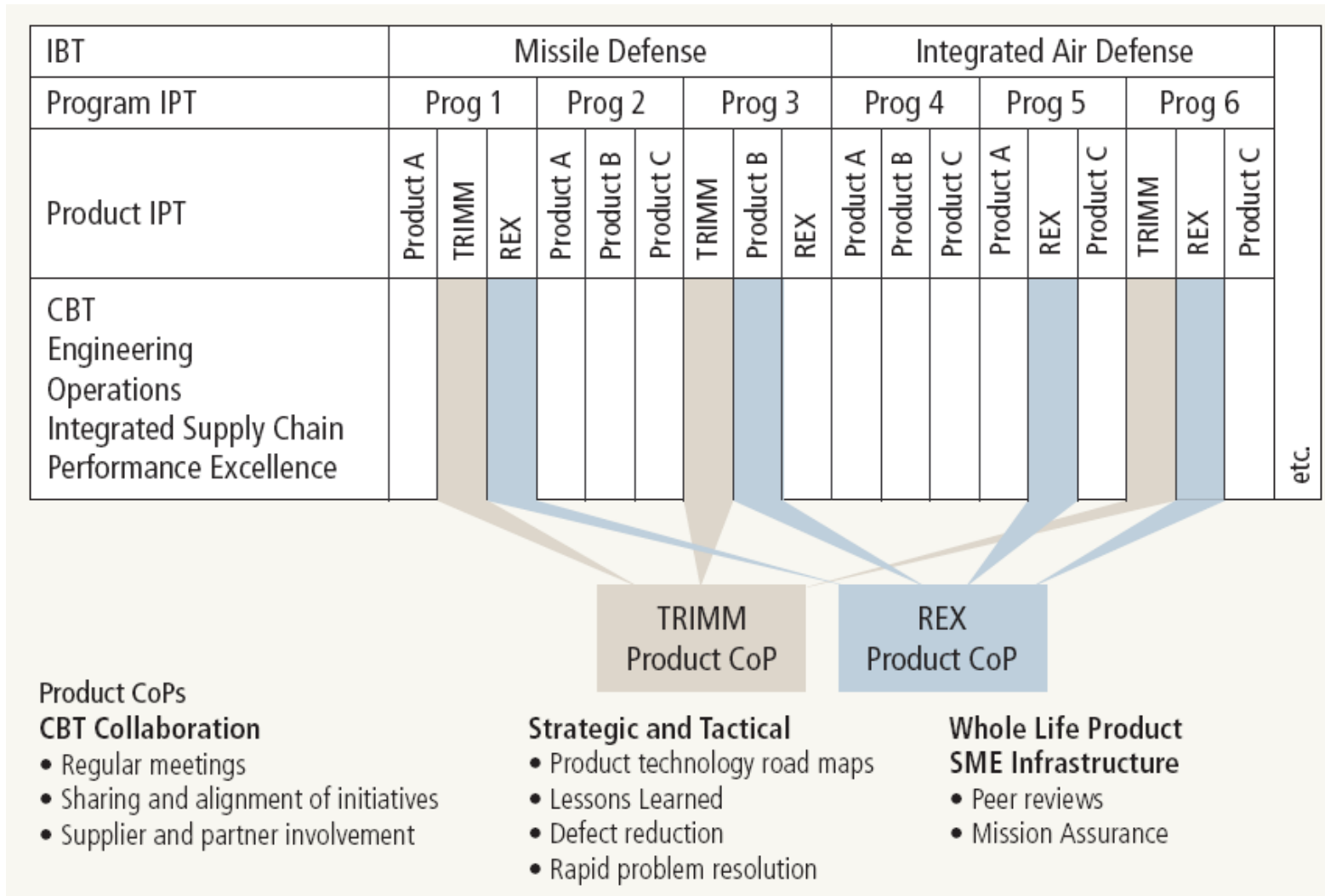
Move the collaborative involvement to the left ... but how?

Strategic Cross-Discipline Collaboration Concurrent Product Development Foundation

Cross-Discipline Collaborative Councils		Council Membership					Charter
		Engineering	Operations	Integrated Supply Chain	Performance Excellence	Product CoPs	
Director Level -Cross-Discipline Council	Integrated Discipline (CBT) Council	D	D	D	D	C	-VP vision alignment -Initiative sharing/resolution -Major initiative generation
↑ Initiatives ↓ Aligned Vision/Direction	Discipline-Based Councils -Cross-Discipline Membership		D				-Capability alignment -Future capabilities -Pursuit management -Value equation
				D			-Sourcing strategies -Commodity strategies -Emerging supplier technology
		Engineering Cross-Discipline (CBT) Lessons Learned Council	L				C
Product-Based CoPs -Cross-Discipline -Cross-IPT	CCA CoP Receiver/Exciter CoP Interconnect CoP Etc.	L L L					-Lessons learned -Defect phase containment -Product roadmaps -Preferred parts

Collaborative involvement independent of program & pursuit

Product Communities of Practice (CoPs) Leveraging Across the Business — Product Focus



A collaborative environment across function & program

Summary

Strategic Collaboration: Everyone Wins

- **High-mix, low-rate businesses present funding profile challenges**
 - Design, process and supplier development occur during program execution
- **Concurrent Product Development can occur before pursuits are known**
 - Leverage **Strategy & People/Organization** outside the program
 - Drive strategic alignment throughout leadership and the organization
 - Form, storm, norm, and perform using strategic initiatives & councils
- **Flow strategy through the organization, share initiatives, resolve disconnects**
 - Don't wait for programs: Plan industry/internal capabilities strategically
 - Share Lessons Learned across programs and disciplines
 - **Process & Tools and Technology** are required pillars and also benefit
- **Get the best from disciplines (CBTs) & programs (IPTs)**
 - Collaborate across both to reduce costs, cycle time & risk

Leverage all 4 Pillars of Concurrency

