Culture transition to CMM-Integrated: The gold is at the end of the rainbow

Bryan Pflug
The Boeing Company

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Boeing Core Competencies & Values

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Product diversity: Integrated Defense Systems

Homeland Security and Services

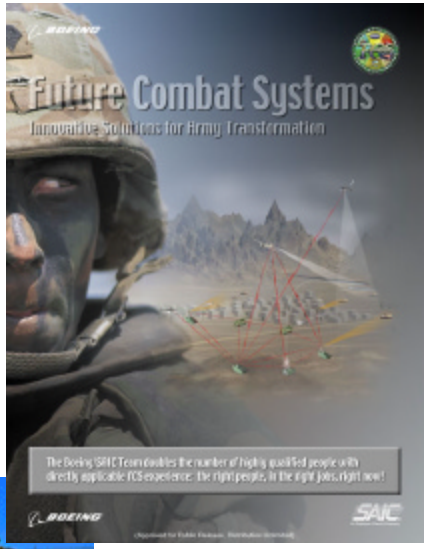
Missile Defense Systems

Naval Systems

Space & Intel Sys

Air Force Systems

NASA Systems



Army Systems

Launch and Satellite Systems

Aerospace Support

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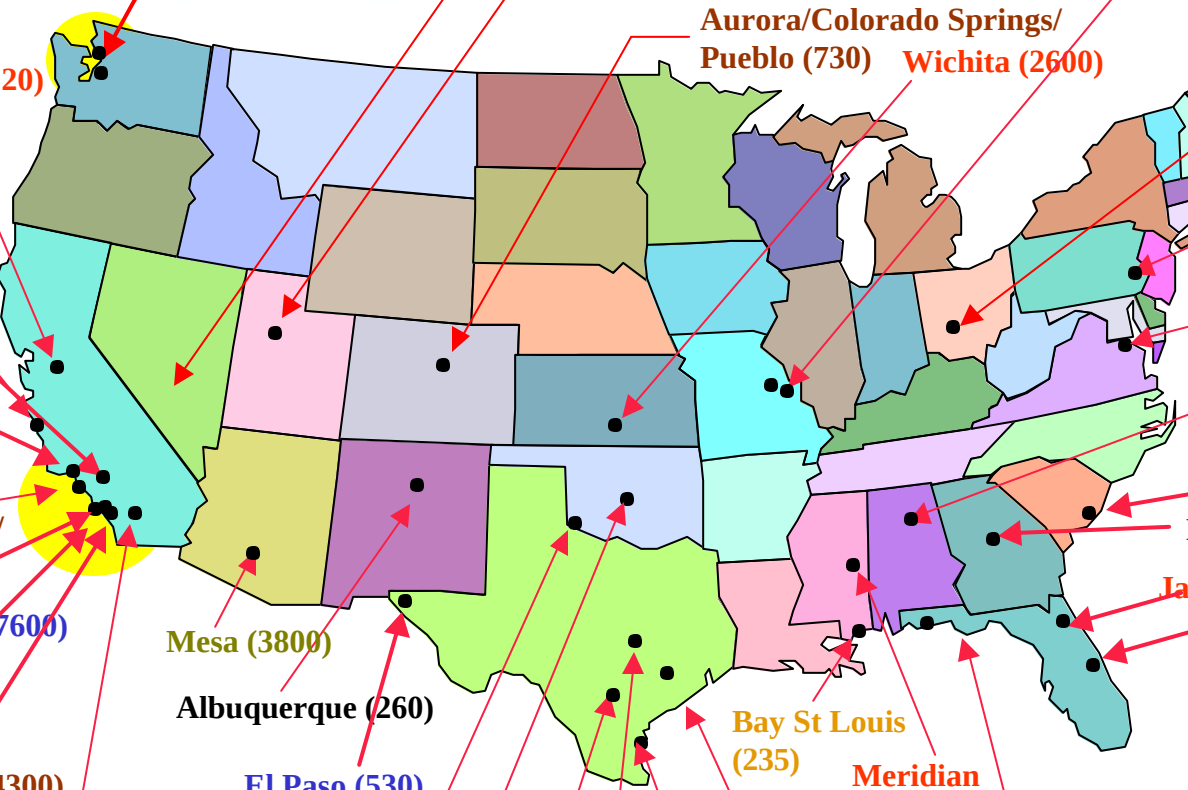
Geographic sites (> 100 employees)



Fallon (250)
Kent (2900)
Ogden (180)
Aurora/Colorado Springs/
Pueblo (730)
Wichita (2600)
St. Charles/St Louis (11,100)
Excludes SSG
and Phantom Works
Heath (670)
Fairfield (120)
VAFB (200)
Philadelphia
(4300)
Palmdale/
Edwards (1000)
Wash DC Area
(1700)
Canoga Park/
West Hills/
Santa Susanna (3100)
Huntsville/
Decatur (3100)
Charleston (150)
El Segundo/Torrance/
Sylmar (8400)
Macon (800)
Jacksonville (134)
Long Beach/Carson (7600)
KSC (2300)
Mesa (3800)
Seal Beach (1700)
Albuquerque (260)
Bay St Louis
(235)
Huntington Beach (4300)
El Paso (530)
Meridian
(300)
Houston
(2100)
Anaheim (3100)
Altus (150)
Kingsville (500)
Ft Walton
Beach (300)
Oklahoma City/
Midwest City (700)
Dallas/Richardson (280)
San Antonio (1900)
Maui (160)

Business Units
Army Systems
Naval Systems
Air Force Systems
NASA Systems
Missile Defense
Homeland Sec & Svcs
Space & Intel Sys
Launch & Satellite Sys
Aerospace Support

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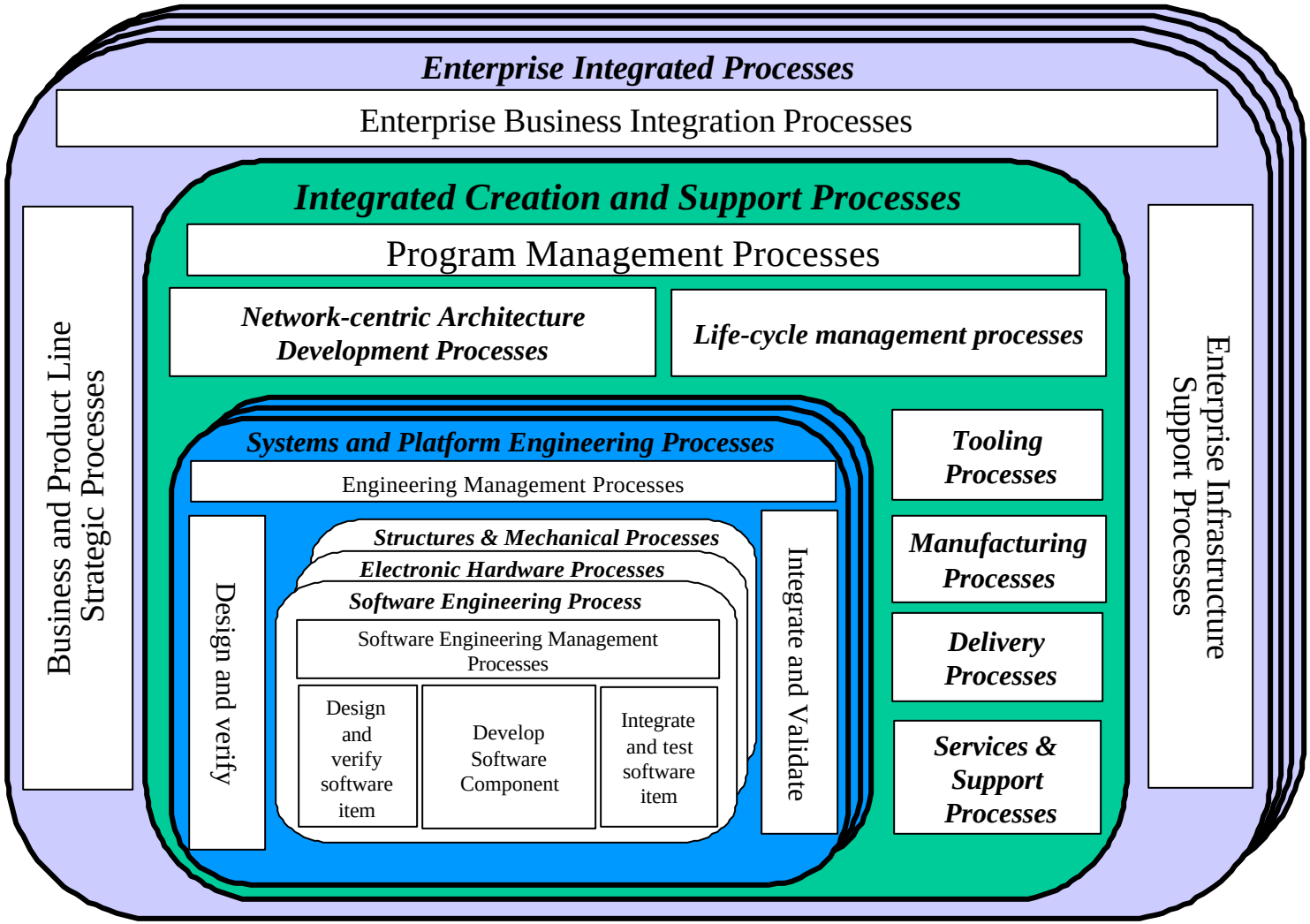
What is integration?

"to form, coordinate, or blend into a functioning or unified whole"

(Source: Merriam-Websters Collegiate Dictionary)

Examples of interfaces to be integrated



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What does the CMMI say about integration?

- **Organizational Process Definition**
  - Subpractice 6 of SP 1.1-1: "Ensure that there is appropriate integration among the processes that are included in the organization's set of standard processes.“
  - Subpractice 3 addresses identification of process elements and their interfaces "among the process elements" and "with external processes.“
- **Organizational Process Focus**
  - the SG1 elaboration for IPPD says "Integrated processes that emphasize parallel rather than serial development are a cornerstone of IPPD Implementation”.

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Uses of process information

- Identify rules of conduct for the enterprise
- Facilitate understanding and communications of business and technical approaches
- Support program and process management
- Support process improvement
- Provision for automated guidance in performing, assuring, or assessing a process
- Provision for automated execution support
- Provide a basis for demonstrating compliance with, or benchmarking against, external frameworks

Opportunities for unintended variation

- Across discrete business element boundaries
- Across planning & execution
- In establishing & tracking schedules
- Across processes, methods, and tools
- Across product teams
- Across design disciplines
- Across stakeholders

Such variation can significantly increase cost, introduce delay, and reduce a group's ability to learn and apply knowledge

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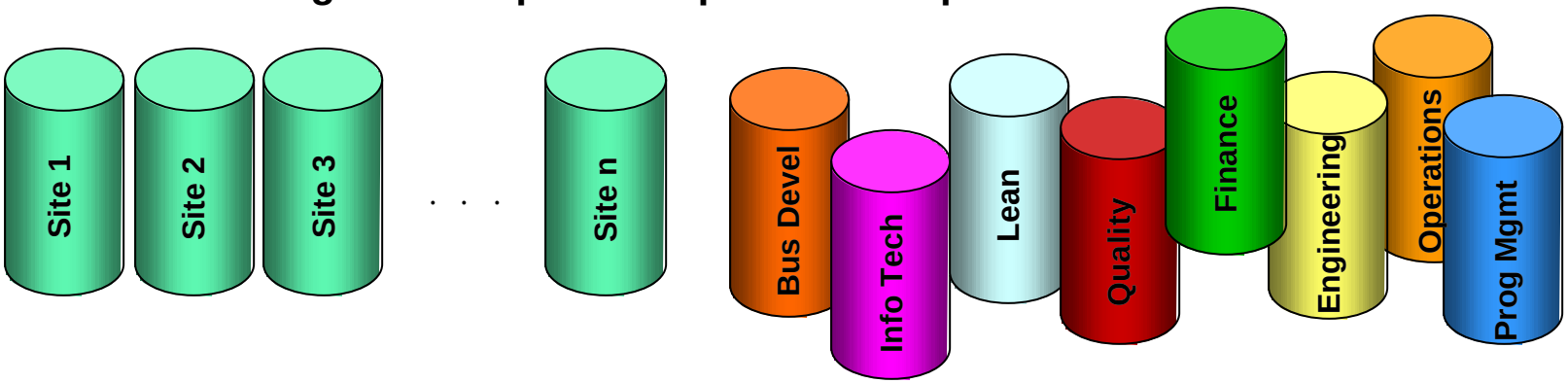
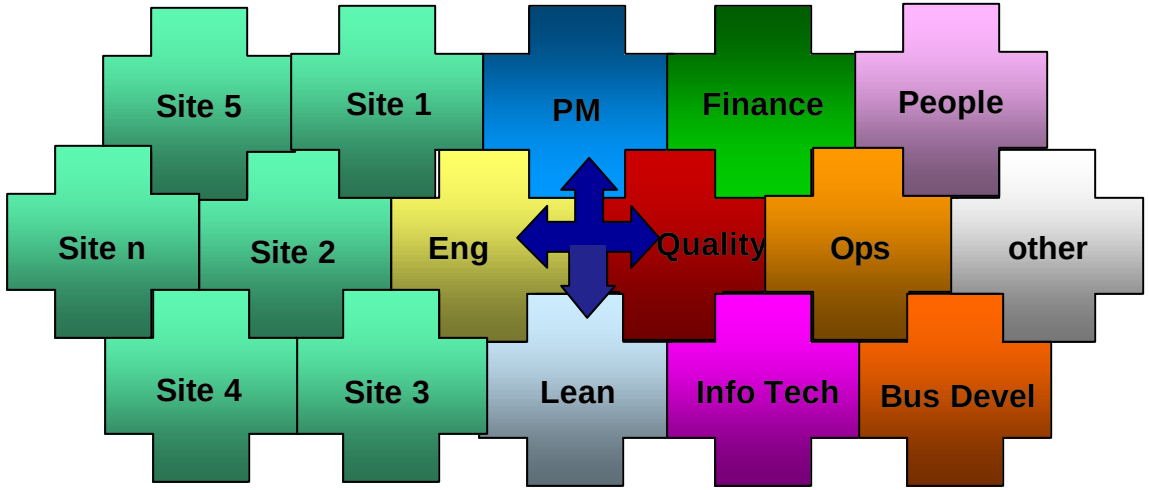
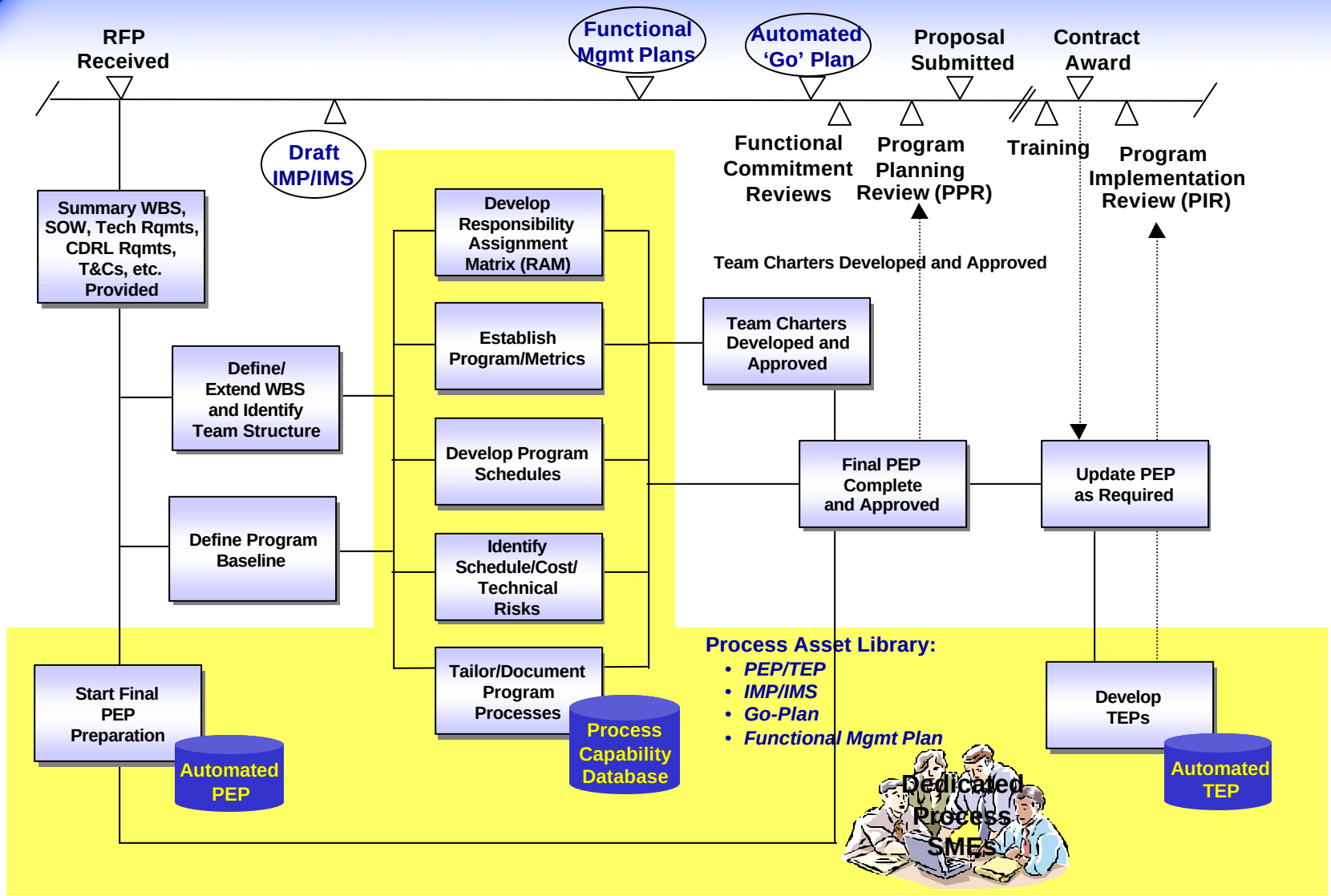
Integrating business elements

- Each separate organization has it own priorities and plans
- This is good except where plans overlap or conflict



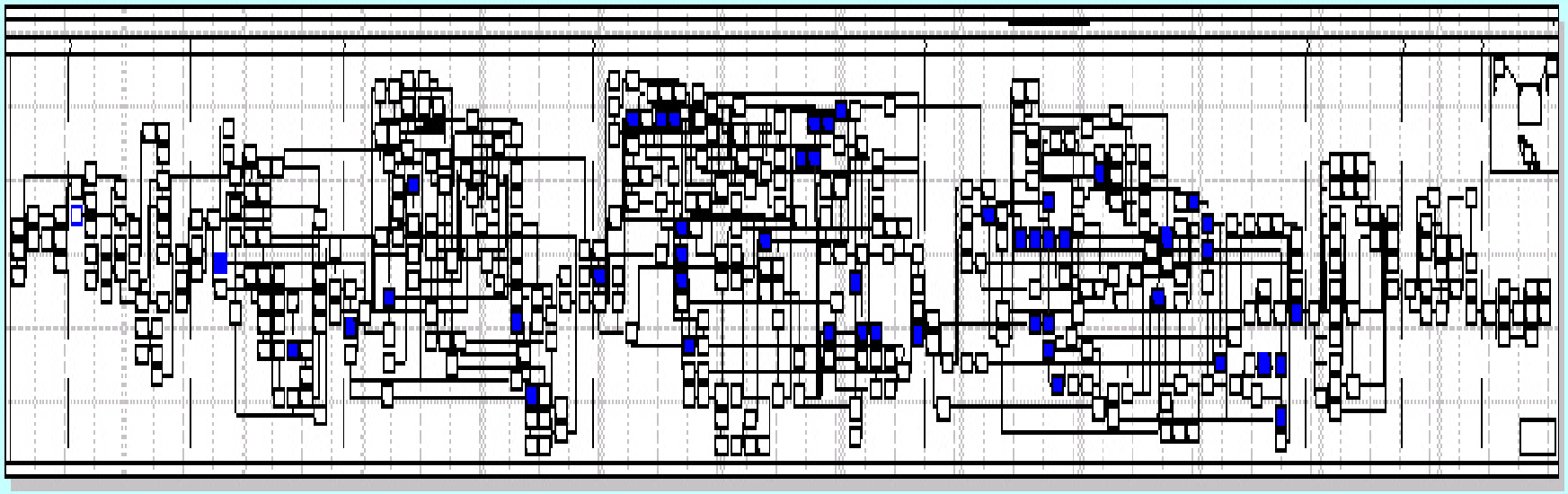


Integrating planning



Integrating schedules

Define Mission Requirements	Concept Definition	Concept Development	Preliminary Definition	Detailed Definition	Build to Package



Technical and business decision-making must be integrated

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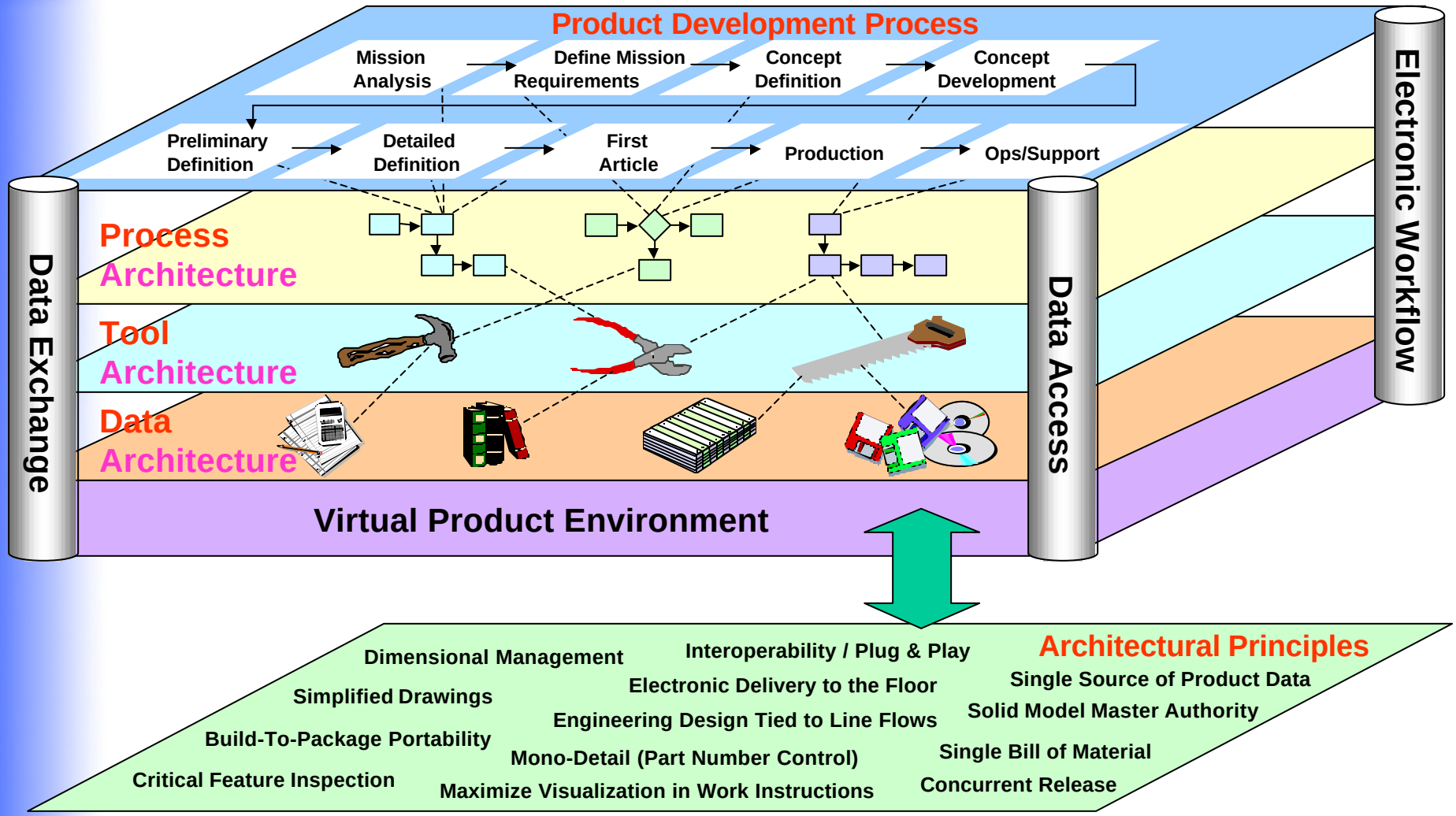
Integrating processes and tools



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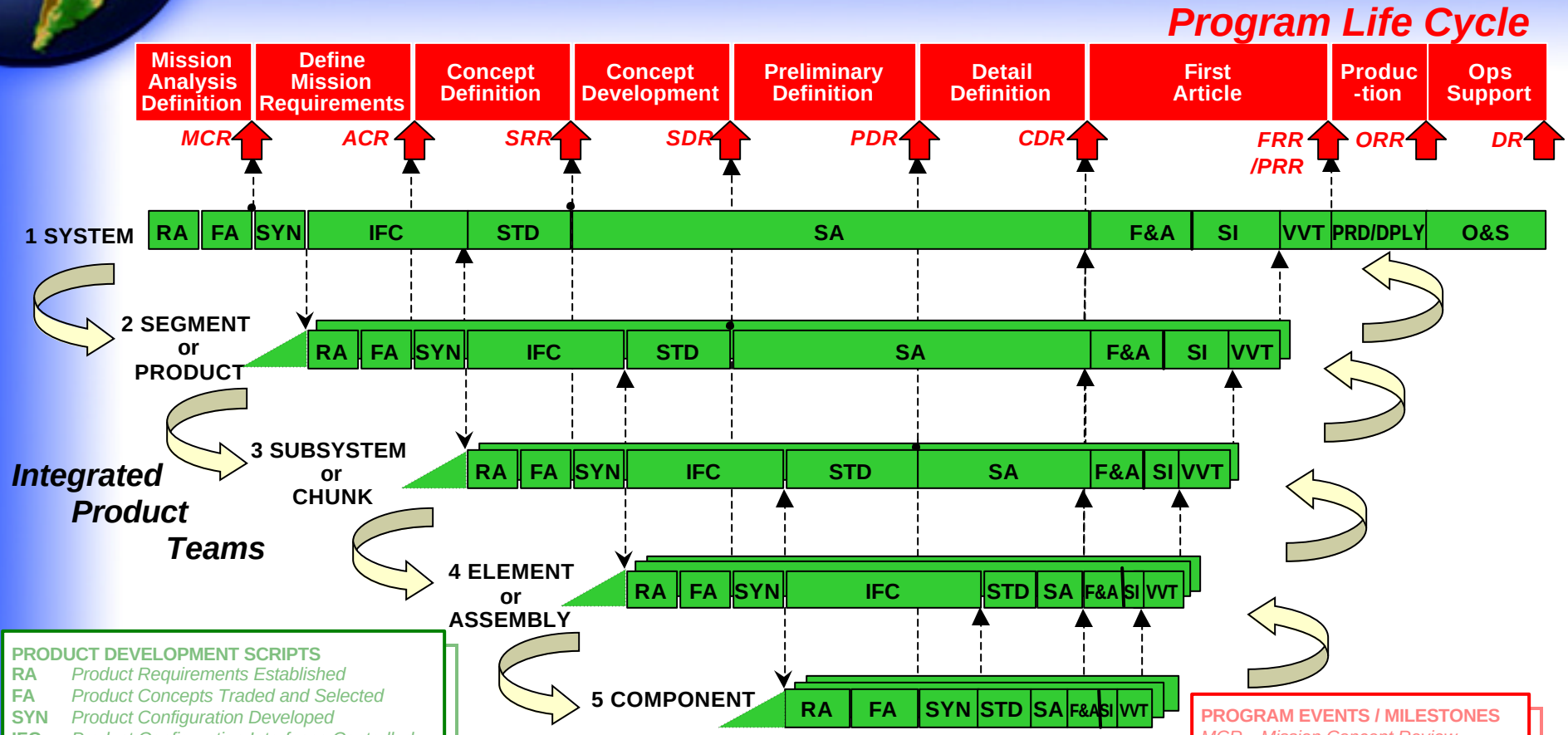
Integrating Product Teams



PRODUCT DEVELOPMENT SCRIPTS

RA	*Product Requirements Established*
FA	*Product Concepts Traded and Selected*
SYN	*Product Configuration Developed*
IFC	*Product Configuration Interfaces Controlled*
STD	*Product Configuration Testing Defined*
SA	*Product Lifecycle Analyzed*
F&A	*Product Fabricated & Assembled*
SI	*Product Integrated*
VVT	*Product Verified,Validated &Tested*
PRD/DPLY	*Product Produced & Deployed*
SPT	*Product Operated & Supported*

Risk Reduction Activities (if required)

Iterative Product Development Process

PROJECT MANAGEMENT SCRIPTS

PLN	*Project Planning & Organization*
PMC	*Project Monitoring and Control*
DSC	*Disciplines Integrated*
SM	*Supplier Management*
RM	*Risk Management*
CM	*Configuration Management*
QM	*Quality Management*

PROGRAM EVENTS / MILESTONES

MCR	*Mission Concept Review*
ACR	*Alternative Concept Review*
SRR	*System Requirements Review*
SDR	*System Design Review*
PDR	*Preliminary Design Review*
CDR	*Critical Design Review*
FRR	*Flight Readiness Review*
PRR	*Production Readiness Review*
ORR	*Operational Readiness Review*
DR	*Decommissioning Review*

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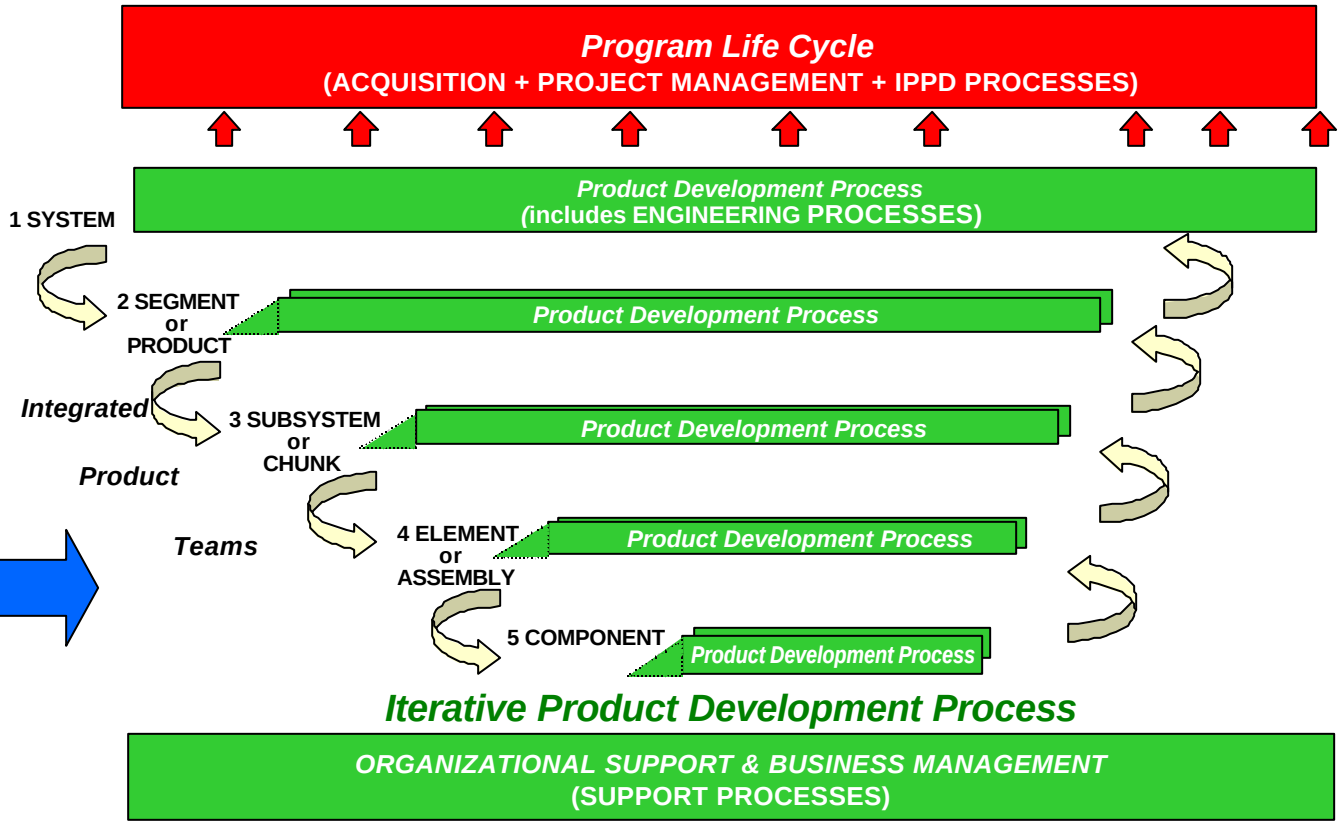
Integrating Design Disciplines

PROCESS MANAGEMENT	
SYSTEMS ENGINEERING & INTEGRATION	•Mission Analysis •Req Analysis •System Architect •Test
FLIGHT SYSTEMS DESIGN & ANALYSIS	•Detailed Design •Test
SOFTWARE & SIMULATION	•Detailed Design •Coding •Test
STRUCTURAL DESIGN & ANALYSIS	•Analysis •Design •Test
PROP/FLUID/ MECH DESIGN & ANALYSIS	•Analysis •Design •Test
AVIONICS DESIGN & ANALYSIS	•Analysis •Design •Test
TEST & EVALUATION	• Analysis • Test



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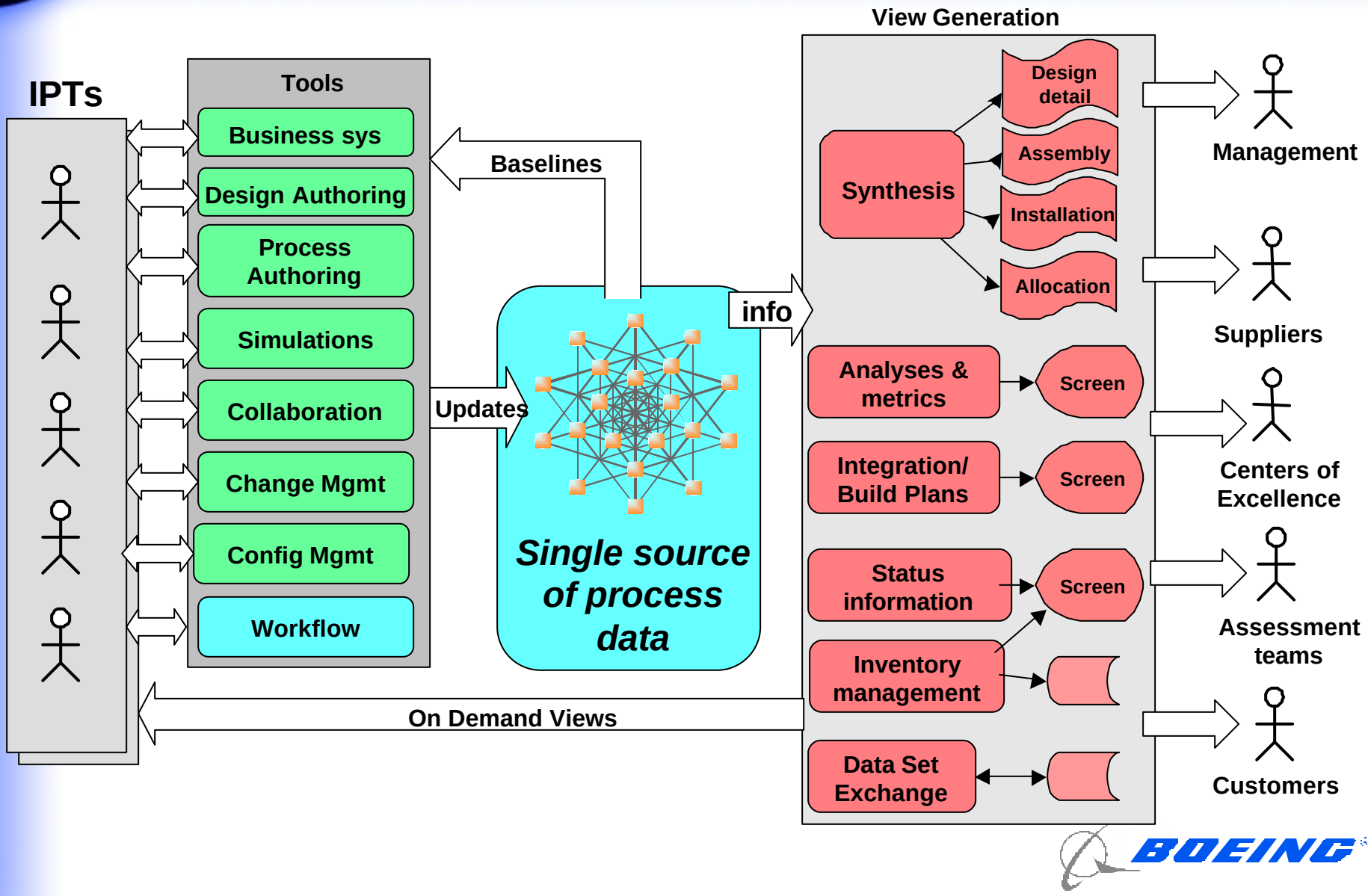
Integrating decision-making across stakeholders



Summary

- The key to realizing business results with CMMI is in successfully accomplishing integration across many dimensions
- Integration is a core competency of Boeing's Integrated Defense Systems organization
- Our CMMI investments provide a complement to existing integration activities which are being leveraged throughout our businesses

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