

Integrity - Service - Excellence



**D&SWS Technology
Development
Orientation Brief**

for
**2008 Technology Maturity
Conference**

11 Sep 2008

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Report Documentation Page

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Overview

- **D&SWS – An Air Force Core Process**
- **Technology Development (TD) Core Sub-Process**
 - **The Problem – Our Solution**
 - **How We Birthed the Three Initiatives**



AFSO21/D&SWS is Part of the Answer



Funding Our Priorities

“We will fund transformation through ... **organizational efficiencies, process efficiencies, reduction of legacy systems and manpower** while sustaining GWOT and ongoing operations in support of the Joint Fight.”

- Michael W. Wynne, SECAF



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The Status Quo is Out



AFSO21

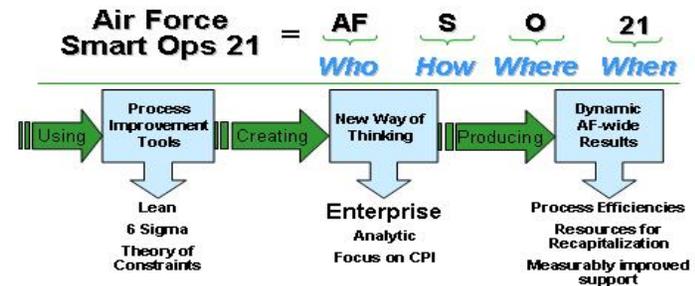
- The USAF will do less with less
- Do what is valued by our customers
- Employ tools and techniques smartly to reduce waste and non-value-added work, to maximize value to the warriors

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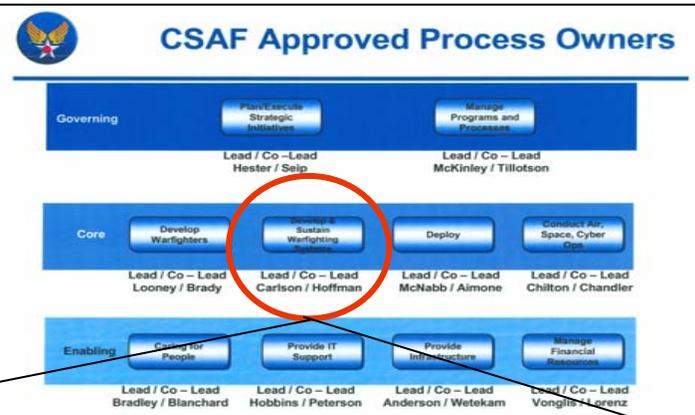


AF Smart Ops 21



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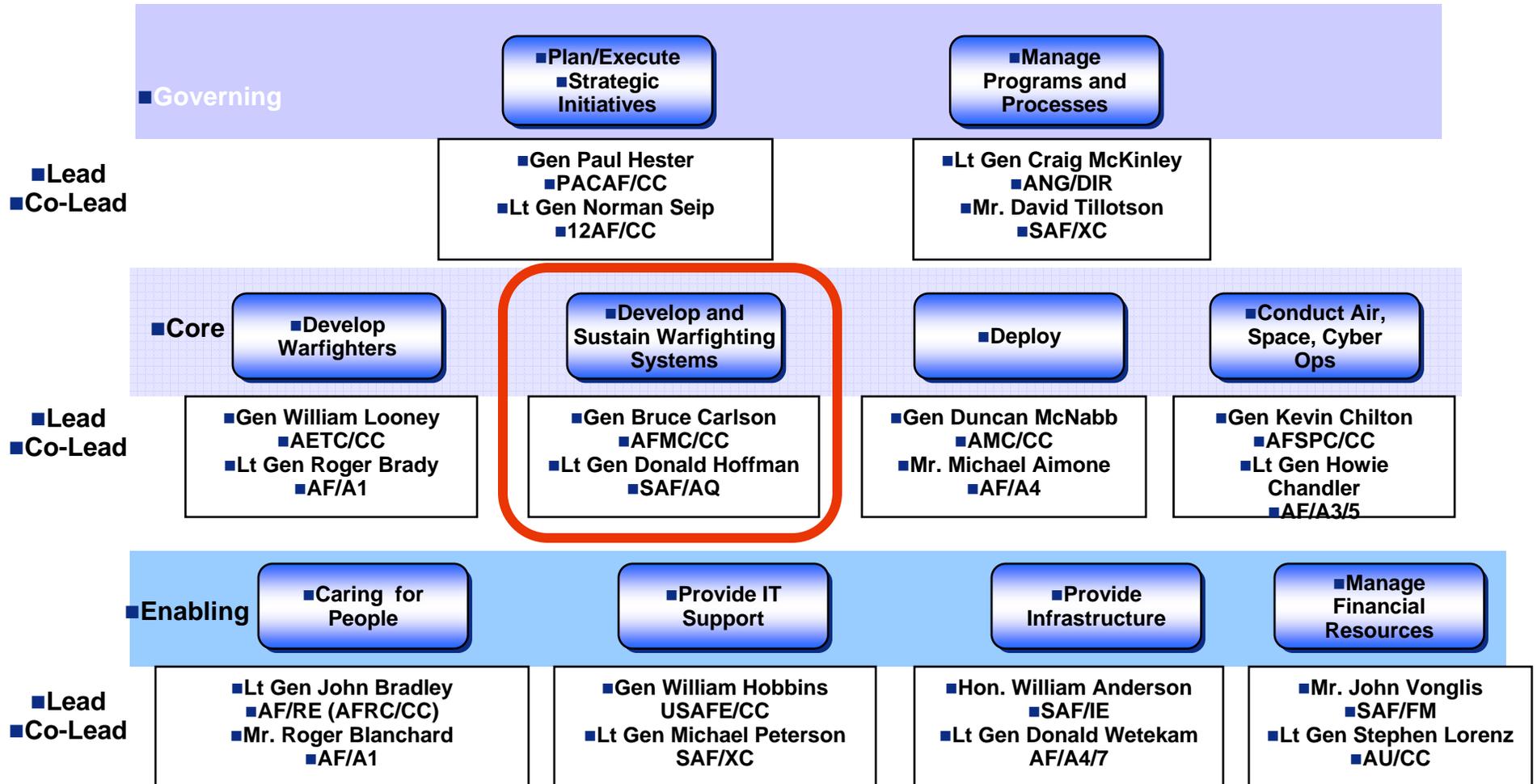


■ Develop and Sustain
 ■ Warfighting Systems (D&SWS)

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SECAF / CSAF Approved Air Force Process Owners



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D&SWS Sub-Process Teams

(Jun '08)

- Process Owner
- Co Lead

- Gen Bruce Carlson
- Lt Gen Don Hoffman
- CPO: MG Marshall Sabol

Institutionalize Standard Work

- *ESC/CA (Ms. Duntz)
- SAF/ACE Dir (Mr. DiCicco)
- AFMC/IG (Col Moran)

Oversight / Command & Control

- *AFMC/A2/5 (BG Wolfenbarger)
- AQX Deputy (Mr. Shelton)
- SAF/IEL (Ms. Walker)

Advisors:

- BG Smoot (AFMC/A1)

Technology Development

- *AAC/CA (Ms. Stokley)
- SAF/AQR (Mr. Jagers)
- AFRL/CC (MG Bedke)

Continuous Capability Planning

- *AFMC/A2/5 (Mr. Brown)
- HAF/A5R (BG Mueller)
- SMC/CV (BG Mashiko)

Lifecycle Management

- *ESC/CC (LG Bowlds)
- ASC/CA (Ms. Wright)
- OC-ALC/CC (MG Reno)

Test and Evaluation

- *AFFTC/CA (Mr. Bond)
- AFOTEC/CC (MG Sergeant)
- AFMC/A3 (BG Lanni)

Supply Chain Operations

- *HAF/A4I (Mr. Dunn)
- AFMC/A4 (BG Bruno)
- AFSPC/A4/7 (Ms. Puckett)

Sourcing

- *AFMC/PK (Mr. Gill)
- SAF/AQC (Mr. Correll)

■ * Indicates Lead



TD Charter

- TD Initiatives Target 2 Key Problems:
 - Immature Technology in Acquisition Programs Leads to Cost Growth and Schedule Slip
 - Many Unprioritized Needs Lead to Sub-optimized Investments

■ Approach

- Implement 3 TD Initiatives to Institutionalize One AF Level Process to Manage Investments in Technologies to Ensure They are Mature for AF Systems
- Provide “Standard Work” In the Technology Development Arena Where It Makes Sense



TD History

How We Birthed...and How We are Implementing Our Initiatives

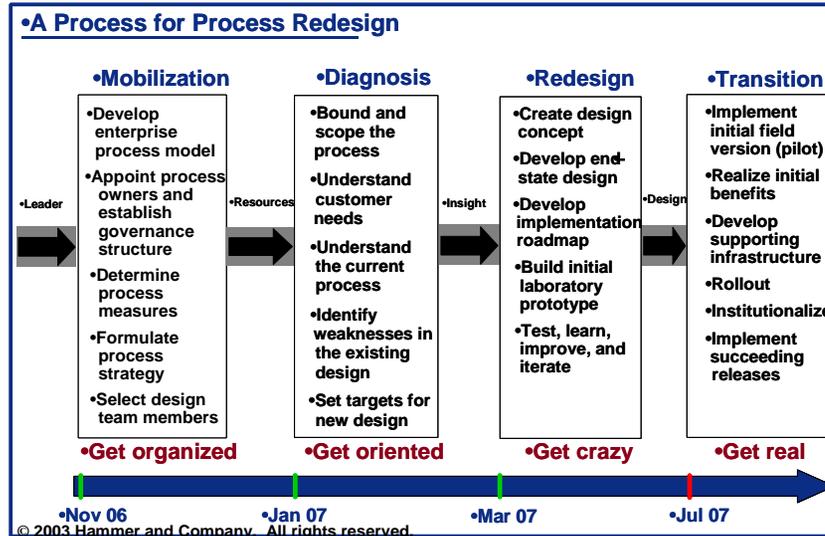
- 6 Dec 06 Design Team Kickoff Meeting
- Large & Diverse Team
- Process-Reengineering Mandate
 - Lean Focus
 - EVSM, SIPOC
 - Diagnosis, Re-design, Transfer of Ownership
- Diagnosis:
 - TD is unwieldy AF process w/many stakeholders & confusion
 - Lean: Value-Added & Non-Value-Added Analysis ☹️
 - Root Cause Analysis (5 Whys) 😊
- Re-Design
- Transfer of Ownership to AF Functional Orgs



Process-Reengineering Summary

Issues and Opportunities	On time / On cost	Improve Availability at reduced cost	Reduce Cycle Time
Institutionalize Standard Work			SE
Lack of integrated policy deployment & interpretation process			SE
Lack of consistent policy & process compliance			SE
Inconsistent process execution			SE
Oversight / Command and Control			SE
Policy process takes too long and content unclear			SE
Decision authority often unclear			SE
Gap - No existing LCM enterprise	SE	SE	SE
LCM Program Decision	SE	SE	SE
LCM Performance	SE	SE	SE
Technical			
Identify and tech needs	SE	SE	SE
Management			
Advisor and Honest Broker (TD13)	SE	SE	SE
Availability Planning			
Availability to program linkage			SE
Lack of disciplined requirements process	SE		
Lack of requirements / budgeting stability	SE		
Lifecycle Management			
Low confidence SDD proposals	SE	SE	
Low confidence AF Program Baseline	SE	SE	
Insufficient Execution & Technical Leverage	SE	SE	
Test & Evaluation			
Need for qualified T&E personnel	SE		
Need for consistent T&E processes	SE		
Supply Chain Operations			
Absence of an Enterprise View		SE	
Fragmented Planning Processes		SE	
Lack of Integration		SE	
No Enterprise System Strategy		SE	
Sourcing			
Ineffective & inefficient acquisition of services	SE	SE	SE
Ineffective & inefficient J&A review and approval process	SE	SE	SE
Supplier relationship Mgt (Strategic view)	SE	SE	SE
Issues/Opportunities Total	12	11	14

"GO FIX" List



End-to-end Assessment Complete:

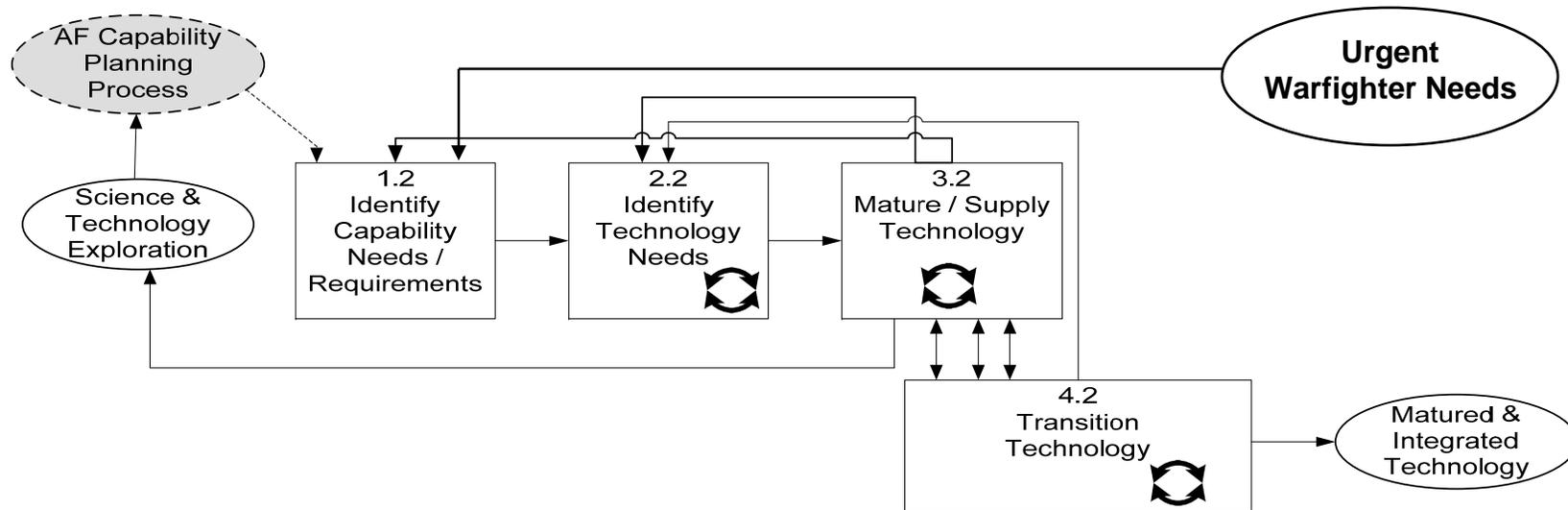
- Significant value-stream analyses and process mapping conducted
- Identified 27 issues / opportunities
- Created “To-Be” state for process redesign
- Multiple process improvement initiatives aligned under 4 Focus Areas
- Measure success against 3 customer-oriented objectives



Tech Development

As-Is Process: Issues & Opportunities

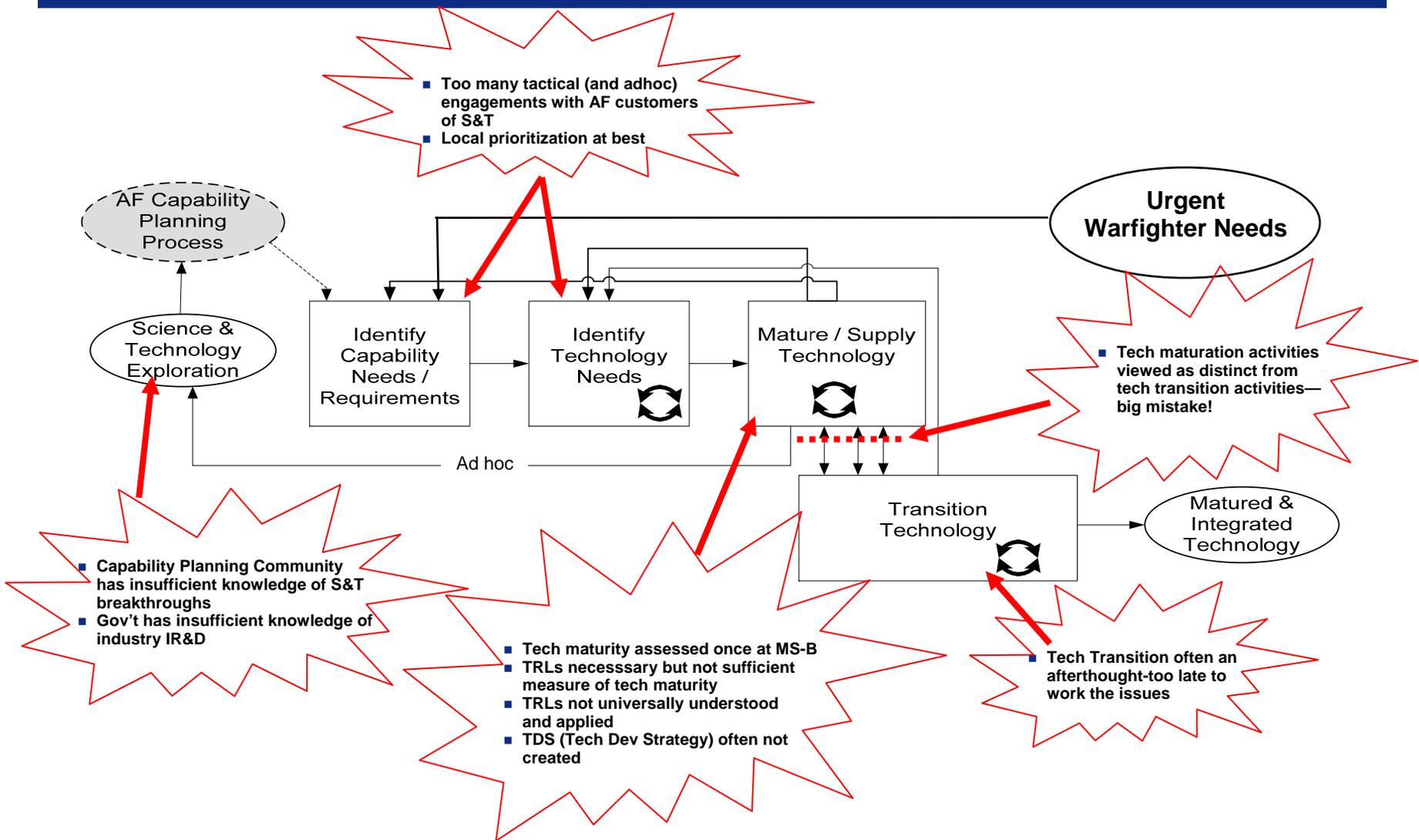
Briefed to D&SWS Process Council Spring 07



- **As-is Process is not well understood; involves many stakeholders; is not conducive to strong and consistent collaboration**
- **16 Issues/Opportunities Identified and Prioritized**
 - **Four principal areas to focus:**
 - Identifying and prioritizing technology investment needs and communicating what we are doing
 - More comprehensive and effective technology maturity assessment
 - Earlier and more responsive Technology Transition Planning
 - Establishing AFRL as the AF's Trusted Advisor and Honest Broker

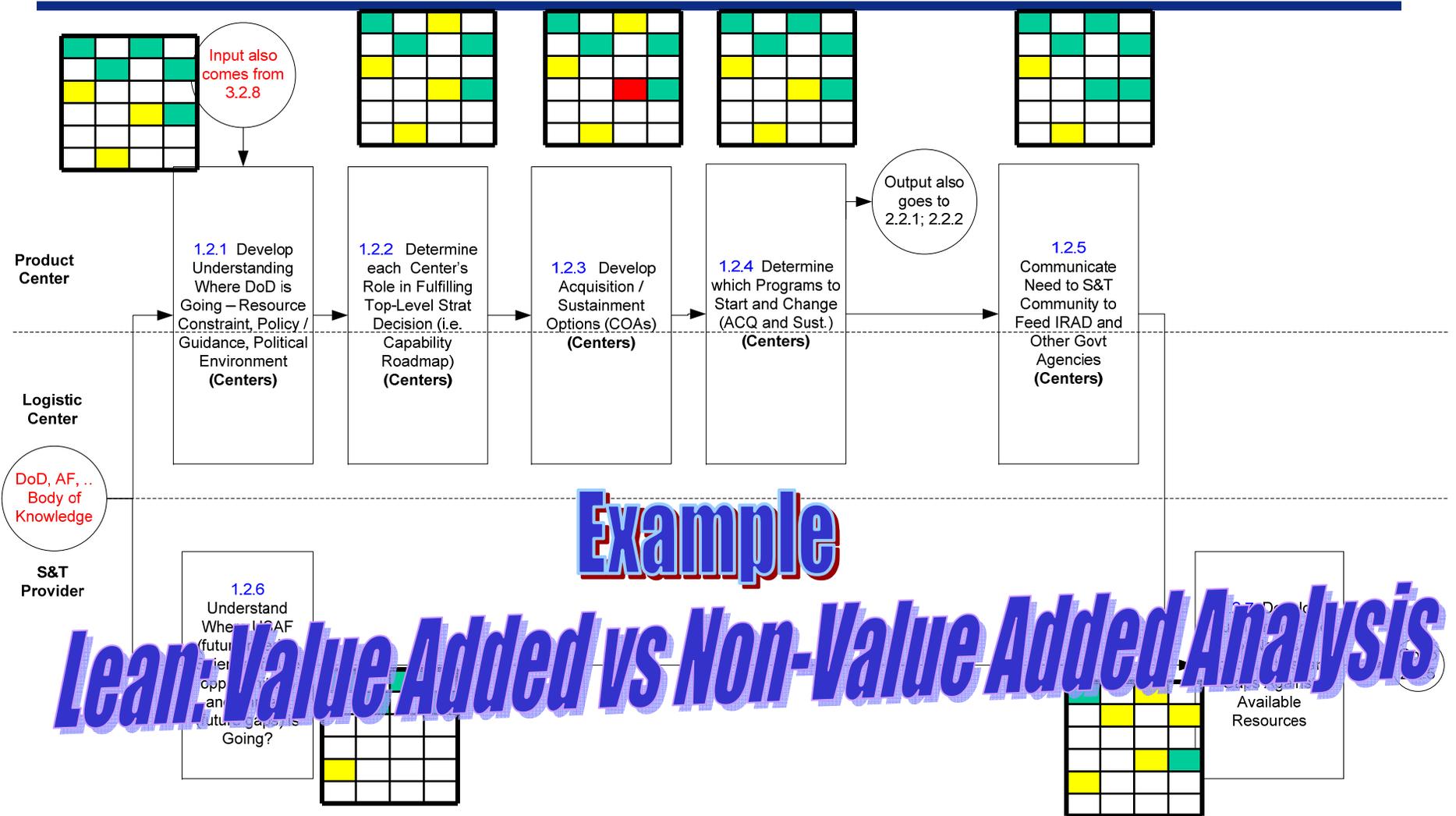


Tech Development As-Is Process: Many Issues





“Lean” Was of Limited Value in Identifying the Problems

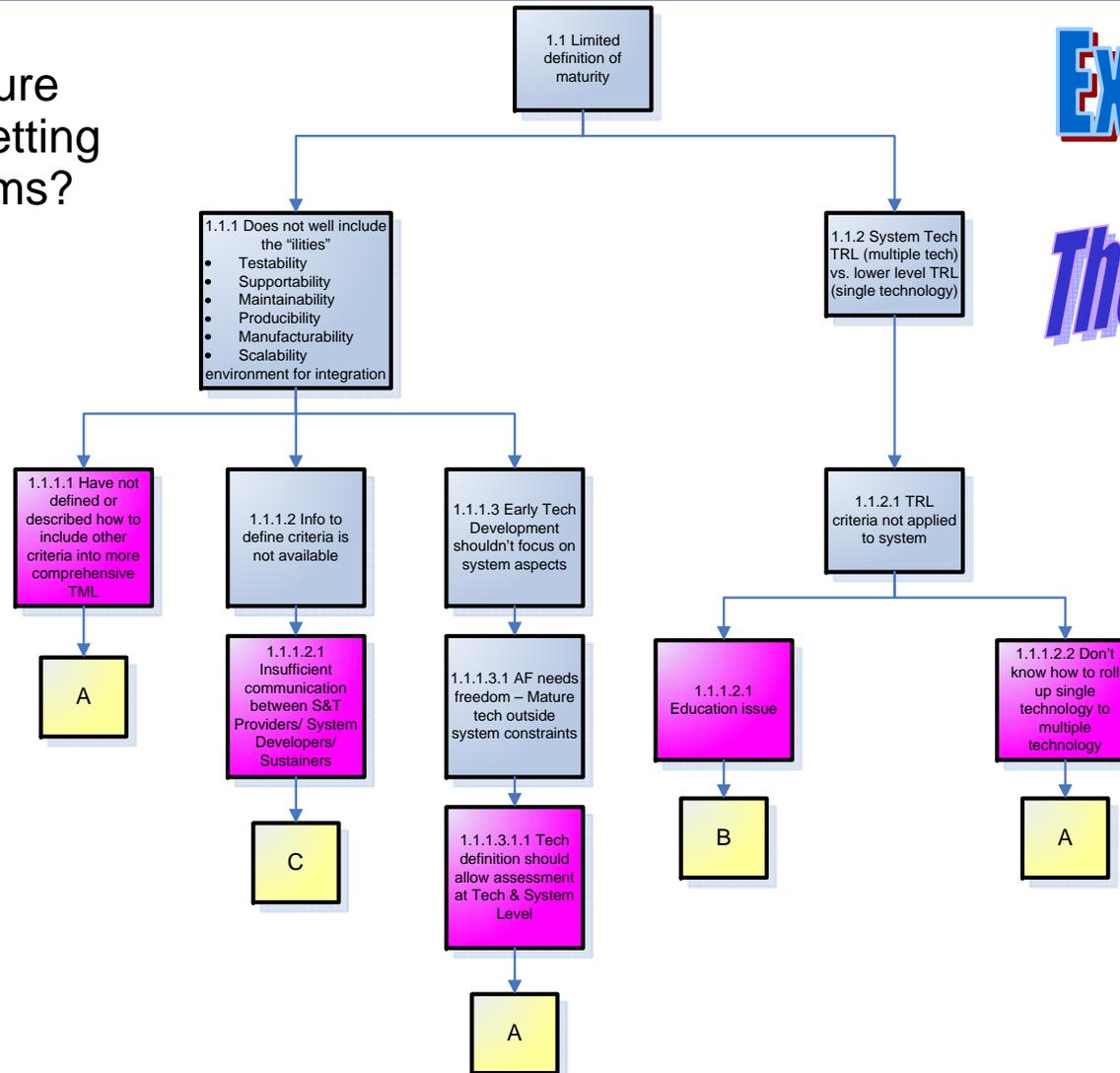




Root Cause Analysis Helped Us Zero-In on the Real Issues

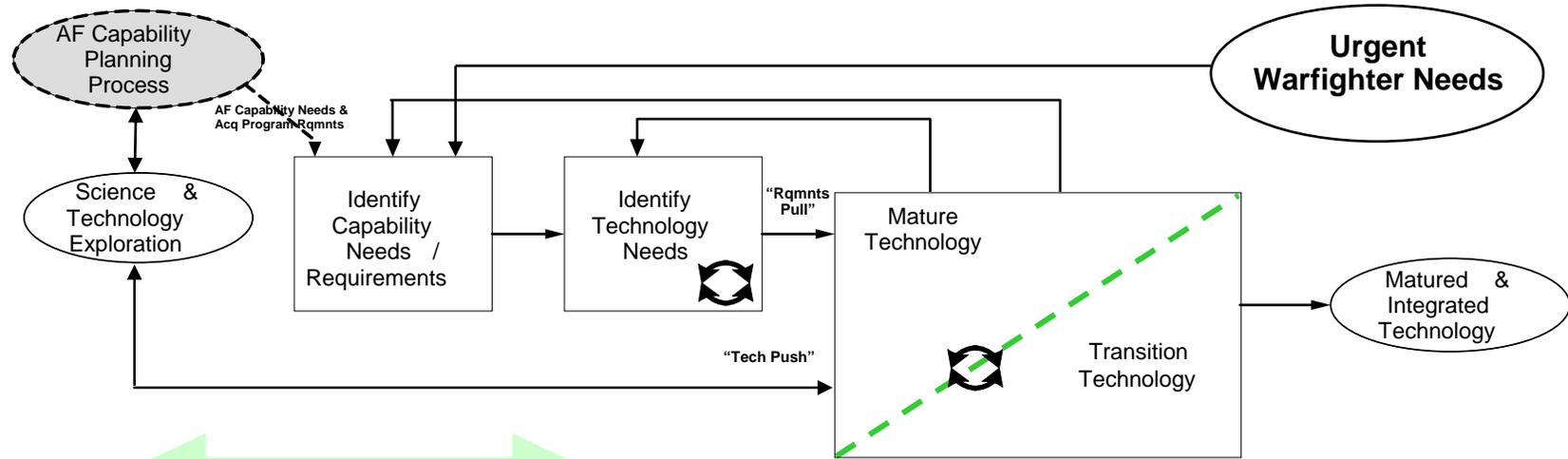
Why Is Immature Technology getting Into our systems?

Example
The 5 Whys





Tech Development “To-Be” Process Opportunities for Improvement



TD-1-14

- Comprehensive ID & prioritization of tech needs
 - Solves the problem of understanding/interpreting AF's Capability Needs and Program Rqmnts
- Game-changing “tech push” influencing capability planning (and vice versa)

AF-Wide Requirements Database

TD-1-12

- More frequent maturity assessments
- More robust maturity assessments
- Common process/tool for Gov't & Industry

Tech Maturity Assessment “Calculator”

TD-1-13

- Earlier transition planning
 - Combined with tech maturation planning
- Gated reviews to ensure timely and robust tech development
 - Also enables tech off-ramps to support Acq “Time Certain Capability”

Transition Planning & Stage-Gating Tool

Tools



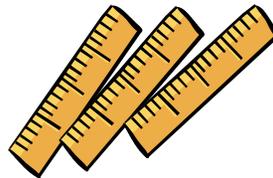
Three TD Initiatives

3 Initiatives with the goal of institutionalizing one AF level process to manage investments in technologies to ensure they are mature for AF systems

■ TD-1-12 Improved Technology Maturity Assessments

- Improved, but Separate, Qualitative Maturity Assessments

- TRA Training
- MRA Training

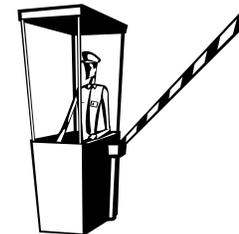


- Improved Software TRL descriptions
- A methodology to help identify Technical Risks related to Integration & 'ilities

■ TD-1-14 Identify and Prioritize Tech Needs

- Focus S&T on highest priority needs
 - Integrate/align existing processes to identify tech needs
 - Develop new process to prioritize short, mid, and far-term needs vice a single "1-n" list
- Game-changing "Tech Push" influencing capability planning

■ Helpful to....



■ TD-1-13 High Confidence Tech Transitions

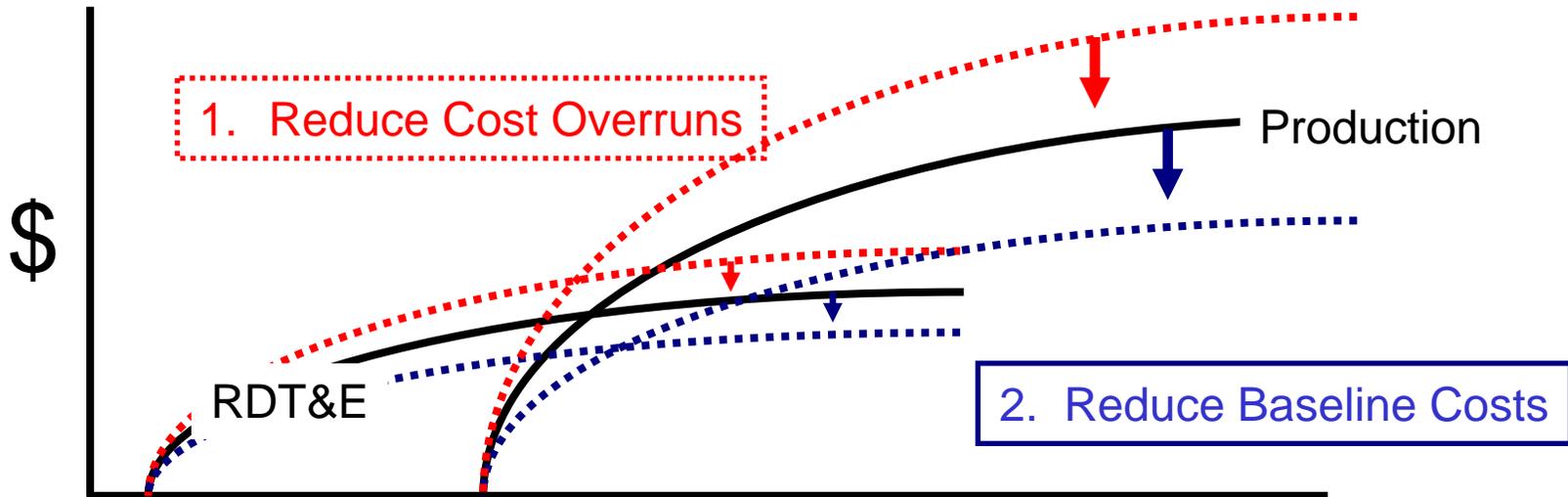
- Early & complete lifecycle transition planning
 - Formal documentation of IPT's plan – TDTS
 - "Plan the Flight"
- "Stage-gated" transition of technology
 - Clearly defined entrance/exit Criteria
 - "Fly the Plan"

■ THE LIST





Two Benefits to Solving the “Immature Technology” Problem



The ability to more accurately assess the maturity of technology, across dimensions more meaningful to acquisition & sustainment programs promises 2 benefits:

1. Pre-MS-B: More accurate assessment of tech maturity guides more complete tech development and enables more accurate program estimates (RDT&E and Production)
Result: Reduction in Cost Overruns (cost avoidance)
- \$1B-\$3.5B per year with an ROI of 2.6-4.2 (GAO report)
2. Post-MS-B: Targeted tech assessments within on-going programs may offer timely (and previously unknown) tech alternatives
Result: Reductions in projected [budgeted] costs (cost avoidance)
- Specific examples available (F-22 AESA with ROI of 76:1, etc.)



Pay Me Now (\$) or Pay Me Later (\$\$)

- **It costs money to save money**
- **It also costs money today to avoid future cost overruns**
- **TD (and other D&SWS initiatives) are proposing initiatives that will drive additional costs earlier in the development cycle**
 - **For TD-1-12 & 13, this means additional RDT&E funding to mature technologies more robustly...earlier...so they are MATURE when they get into acquisition programs**



Want to Change Behavior? Train the Workforce!

- All three TD initiatives propose new processes/tools that will require workforce training
- Both DAU and AFIT have a critical roles
- TD initiatives will develop required workforce training:
 - **Advanced training** for personnel working, or about to work, the new processes/tools (TD-1-12 Only for TRAs and MRAs)
 - **General Awareness training** appropriately tailored to fit into the many existing DAU and AFIT S&T/ Acquisition/ Sustainment “Familiarization” courses

	Advanced Training	General Awareness Training
Computer-Based	AFIT	DAU & AFIT
Classroom	AFIT	DAU & AFIT



Are We Sure Our Process-Improvement Initiatives Will Achieve Desired Affect?

- TD-1-12 and TD-1-13 will participate in D&SWS pathfinders
 - Five Pre-MS B AF Acquisition Programs Designated as Pathfinders

Seven D&SWS Initiatives to be “Tested”

- LCM-1-7: Time Certain Capability
- LCM-1-8: High Conf Baselines
- LCM-1-9: Life Cycle Affordability Planning
- CCP-1-10: Time-Phased Requirements Development
- TD-1-12: Improved Technology Maturity Assessments
- TD-1-13: High Confidence Technology Transitions
- TE-1-16: T&E Milestone B Support

- New TD processes will be integrated into an existing schedule as expeditiously and cost-effectively as possible
- However...D&SWS pathfinders will provide limited verification and validation of TD initiatives
 - Will not sufficiently exercise TD’s process improvements
- Additional pilots will be required (Some of AFRL’s 6.3 portfolio)



Summary

- **We diagnosed the problem**
 - **Why/How is Immature Technology Getting into Weapon Systems?**
- **We proposed solutions - Process-Improvement Initiatives Designed to:**
 - **More robustly Assess Technology Maturity (TD-1-12)**
 - **Plan Transition Earlier & Be More Disciplined in Implementing Those Plans (TD-1-13)**
 - **“Plan the Flight...Fly the Plan!**
- **Tools, Training, Policy Will Facilitate Implementation**
- **Getting Ready to “Test our Products”**