CCRTS

2004

MANAGEMENT AND INTRODUCTION OF TECHNOLOGY - AN OSD OFFICE OF TECHNOLOGY TRANSITION PERSPECTIVE FOR EFFECTS BASED SUPPORT IN THE NEW SECURITY ENVIRONMENT

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OUTLINE

- EVOLUTION TO OPERATIONAL ENGINEERING
- PROGRAM MANAGER, OSD, AND RESOURCES
- WHERE IS TECHNOLOGY IN RMA
- OTT & PROGRAMS - NAVAL EXAMPLES
- SUMMARY & RECOMMENDATIONS
- THE ‘SO WHAT’ FACTOR

TAKE AWAYS

- WORK ENVIRONMENT REMAINS CHALLENGING, YET TOOLS ARE AVAILABLE
- WITHOUT ‘BIG PICTURE’ CONTEXT, ANY PATH MIGHT BE ‘TOO LONG A PATH’ FOR DELIVERY
- DEVELOPMENT AND SUSTAINING TOOLS ARE AVAILABLE
- OTT (DUSD(AS&C)) ‘FAMILY OF TOOLS’ ADDRESSES MULTIPLE STAGES OF LIFE CYCLE TOTAL OWNERSHIP COSTS
- EXAMPLES – NAVAL AND COMMERCIAL
- HOW THE TOOLS ARE USED HAS FUTURE IMPACT

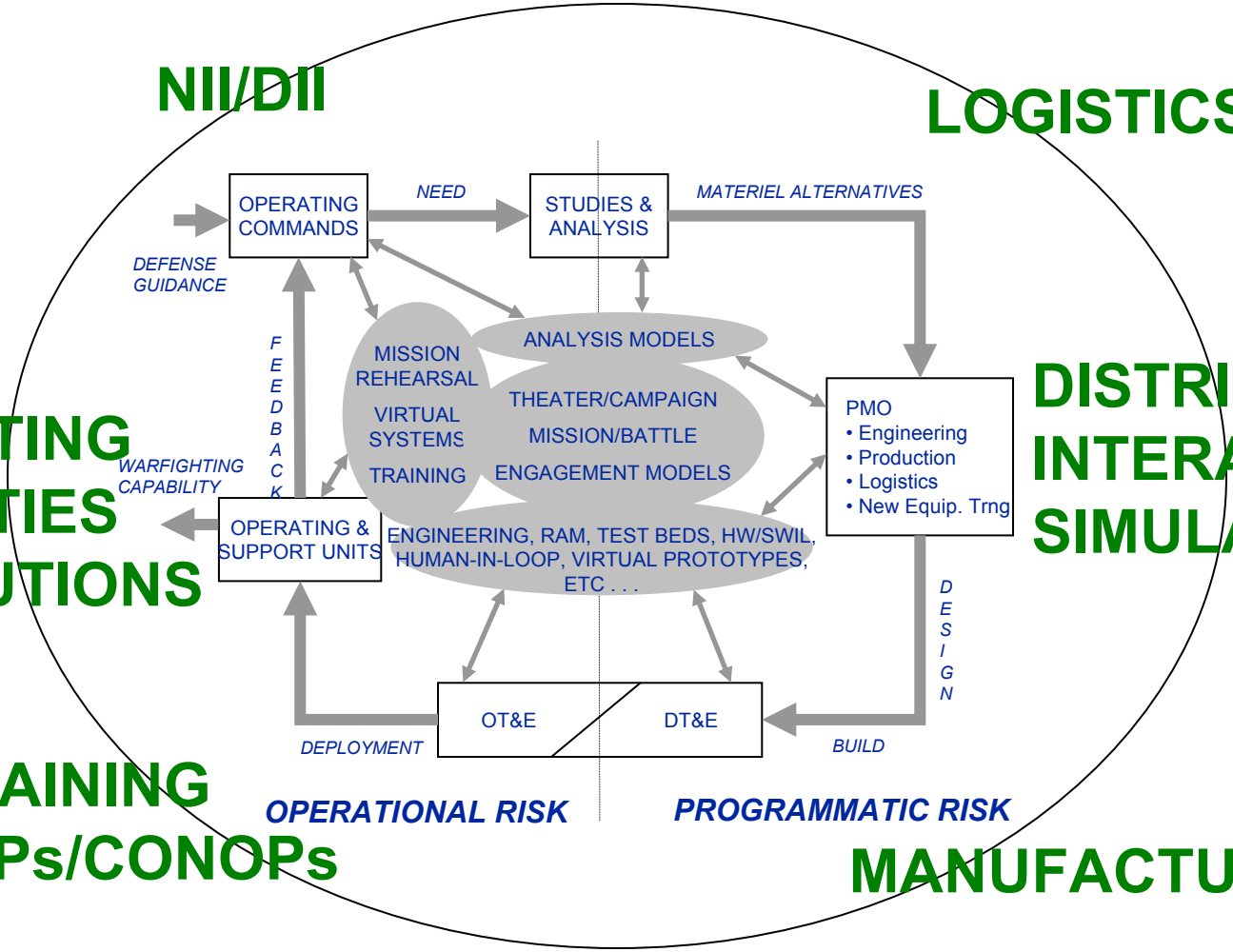
SYSTEMS ACQUISITION PROCESS CYCLE

NII/DII

LOGISTICS

MISSION WARFIGHTING CAPABILITIES CONTRIBUTIONS

DISTRIBUTED INTERACTIVE SIMULATION



TRAINING TTPs/CONOPs

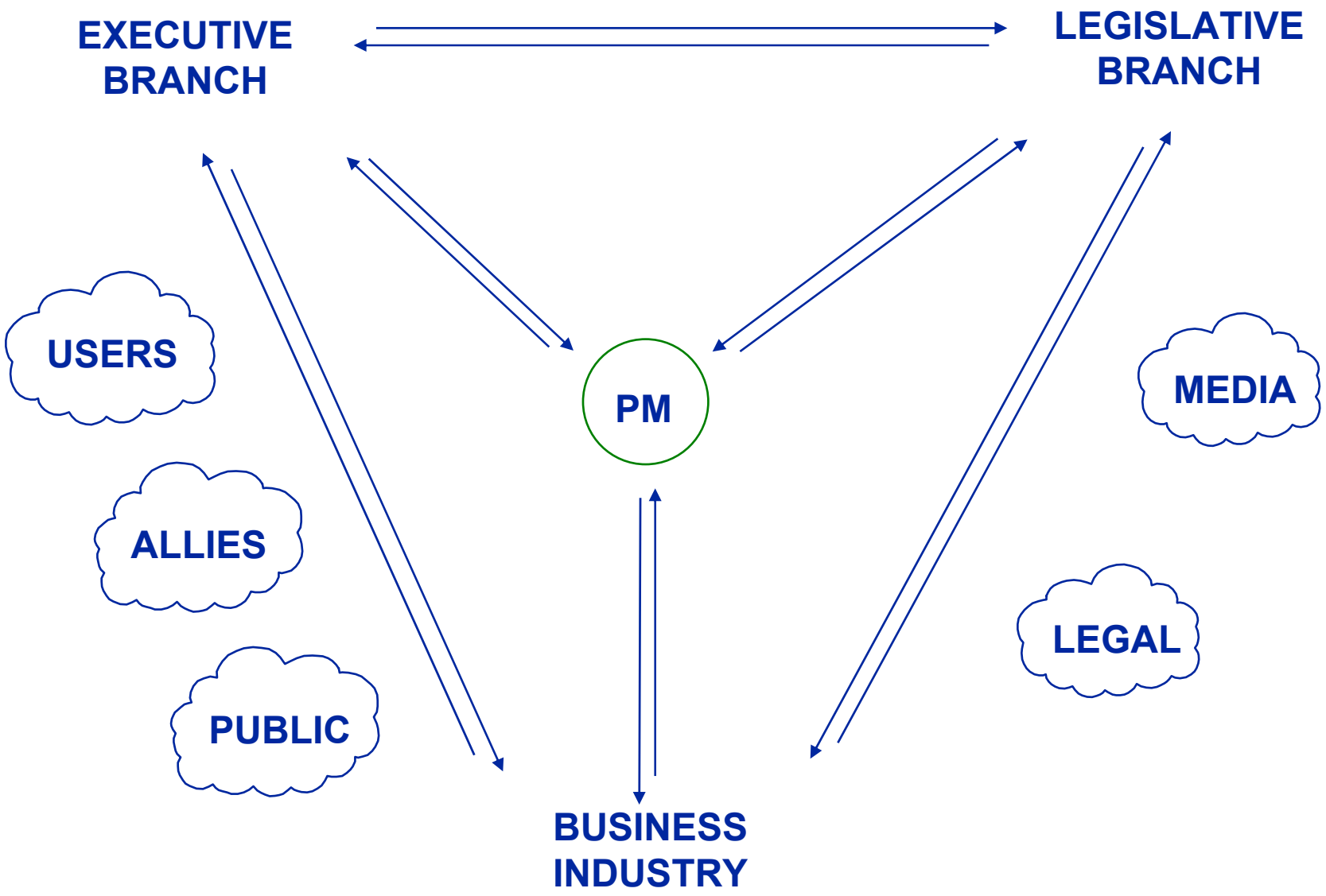
OPERATIONAL RISK

PROGRAMMATIC RISK

MANUFACTURING

EVOLVING TO OPERATIONAL ENGINEERING

THE TORTURED / IRON TRIANGLE



Source: Fig 1-1 The Program Managers Environment. "Introduction to Defense Acquisition Management." Joseph H. Schnoll. DSMC, Ft. Belvoir, VA. JUNE 1996. p. 6.

THE OSD ENVIRONMENT

- DOD WILL *RELY ON THE PRIVATE SECTOR TO PROVIDE MUCH OF THE LEADERSHIP IN DEVELOPING NEW TECHNOLOGIES*. THUS, THE DEPARTMENT HAS EMBARKED ON . . . THIS "QUIET REVOLUTION" [WHICH] WILL *TAKE ADVANTAGE OF SCIENCE AND TECHNOLOGY AND CONTINUE TO PROVIDE U.S. FORCES WITH TECHNOLOGY SUPERIORITY*. (QDR, p. 41, 30 September 2001) (Emphasis added.)

- AT&L OBJECTIVES
  - ACQUISITION AND LOGISTICS SUPPORT PROCESS
  - DOD AT&L WORKFORCE
  - DEFENSE INDUSTRIAL BASE
  - WEAPON SYSTEMS AND INFRASTRUCTURE RATIONAL
  - HIGH LEVERAGE TECHNOLOGIES FOR FUTURE WARFIGHTING

- DEFENSE (S&T) - . . . TO ENSURE THE WARFIGHTERS TODAY AND TOMORROW HAVE SUPERIOR AND AFORDABLE TECHNOLOGY TO SUPPORT THEIR MISSIONS, AND PROVIDE REVOLUTIONARY WAR-WINNING CAPABILITIES. (Aldridge & Etters Congressional testimony 26 June 2001)

EVOLVING OSD POLICY

QDR: Sep 2001

- Move From "Threat-Based" to "Capabilities-Based" Planning
- Key Military-Technical Trends of Adversaries

⇨ Exploit R&D to Maintain Decisive lead in Technologies

⇨ Develop & Exploit Technologies

⇨ Reduce Cycle Time

USD(AT&L) Goals

⇨ Achieve credibility & effectiveness in the acquisition & logistics support process

- Revitalize the quality and morale of the AT&L workforce

⇨ Improve the health of the defense industrial base

- Rationalize the weapon systems and infrastructure with the defense strategy

⇨ Initiate high leverage technologies to create warfighting capabilities, systems, & future strategies

DDR&E Priorities

⇨ Enable future DoD capabilities through an integrated technology program

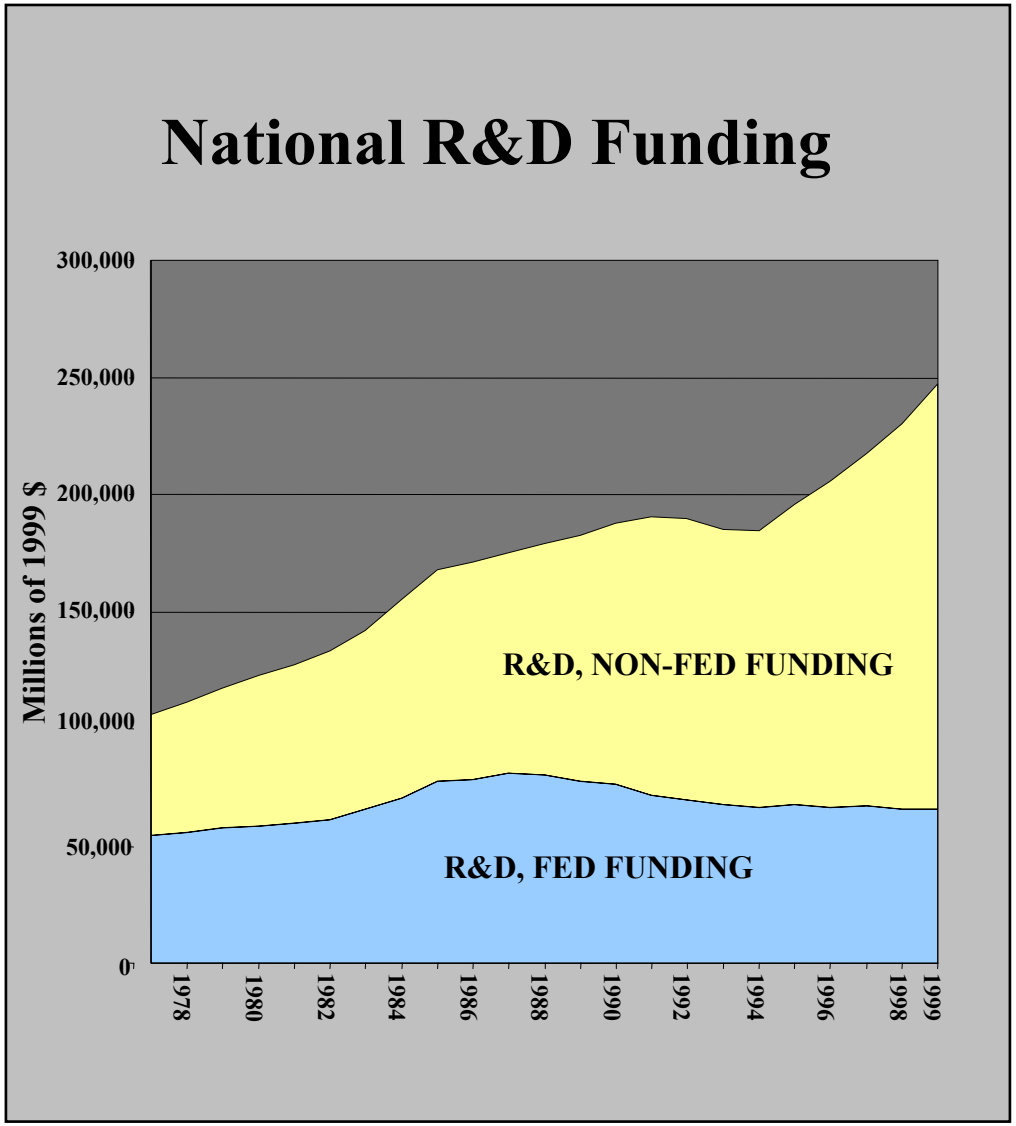
⇨ Accelerate technology transition to the warfighter

⇨ Enhance near term technical support

- Revitalize the DoD laboratories
- Develop, attract and retain a quality national security technical workforce

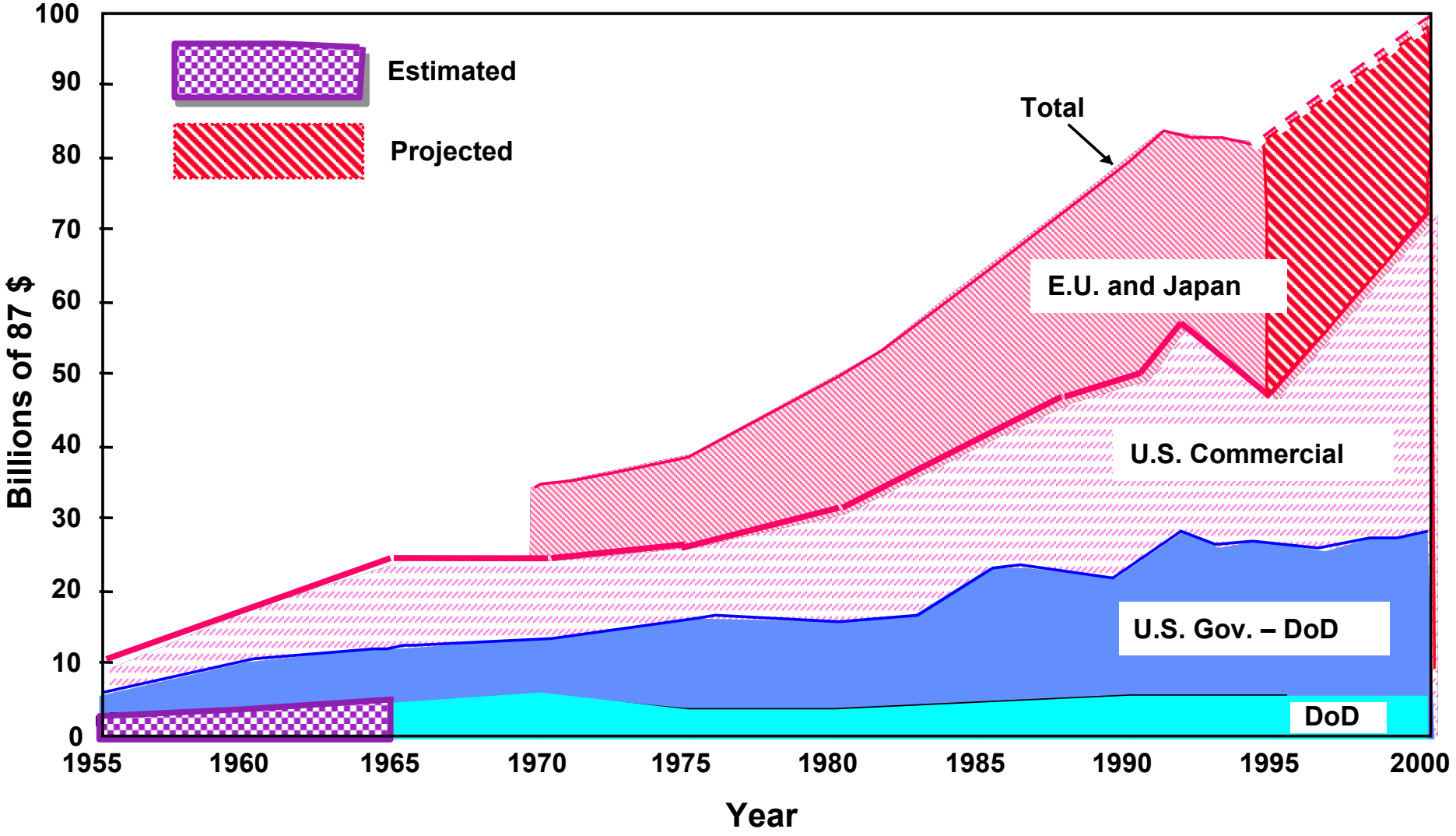
⇨ **Issues Requiring Attention to Improve the Technology Transition Process**

TECHNOLOGY TREND



- **DoD facing:**
  - A changing threat
  - An explosion of technological advances around the globe
  - An ever increasing growth in commercial R&D compared to defense spending
- **These changes demand new ways for the DoD to develop and acquire technology**
  - Greater exploitation of commercial technology investment
  - Ability to more rapidly transition technology investments

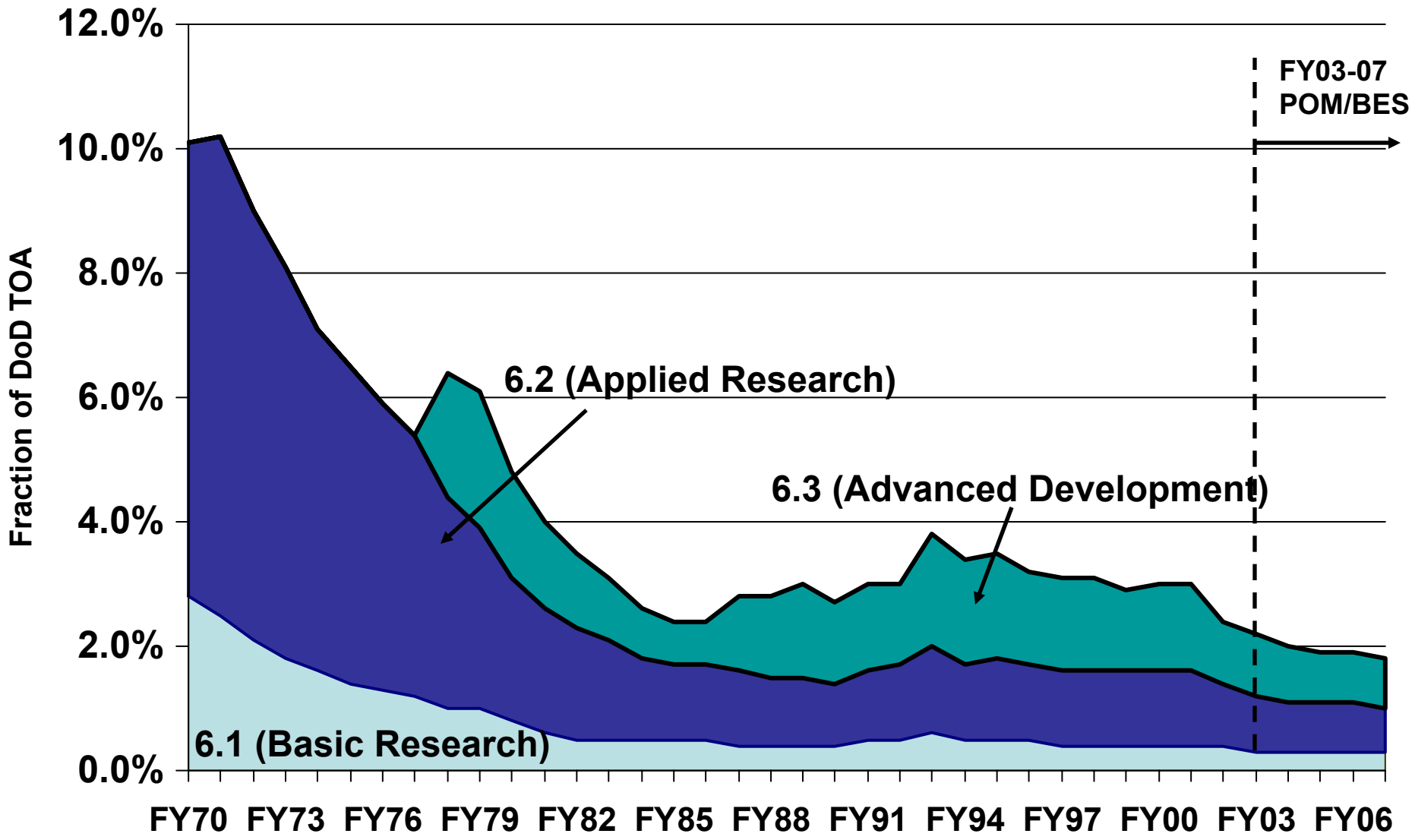
U.S. AND WORLDWIDE RESEARCH BASE SINCE WWII



Source: Report of the Defense Science Board Task Force on the Technology Capabilities of Non-DoD Providers; June 2000; Data provided by the Organization for Economic Cooperation and Development & National Science Foundation

Extract from Dr. Sega, NDIA 'DoD Technology Exposition' 5-7 Feb 2000, "DoD S&T Strategy and Plans" Presentation Slides.

DOD SCIENCE & TECHNOLOGY FUNDING HISTORY RELATIVE TO DOD TOA



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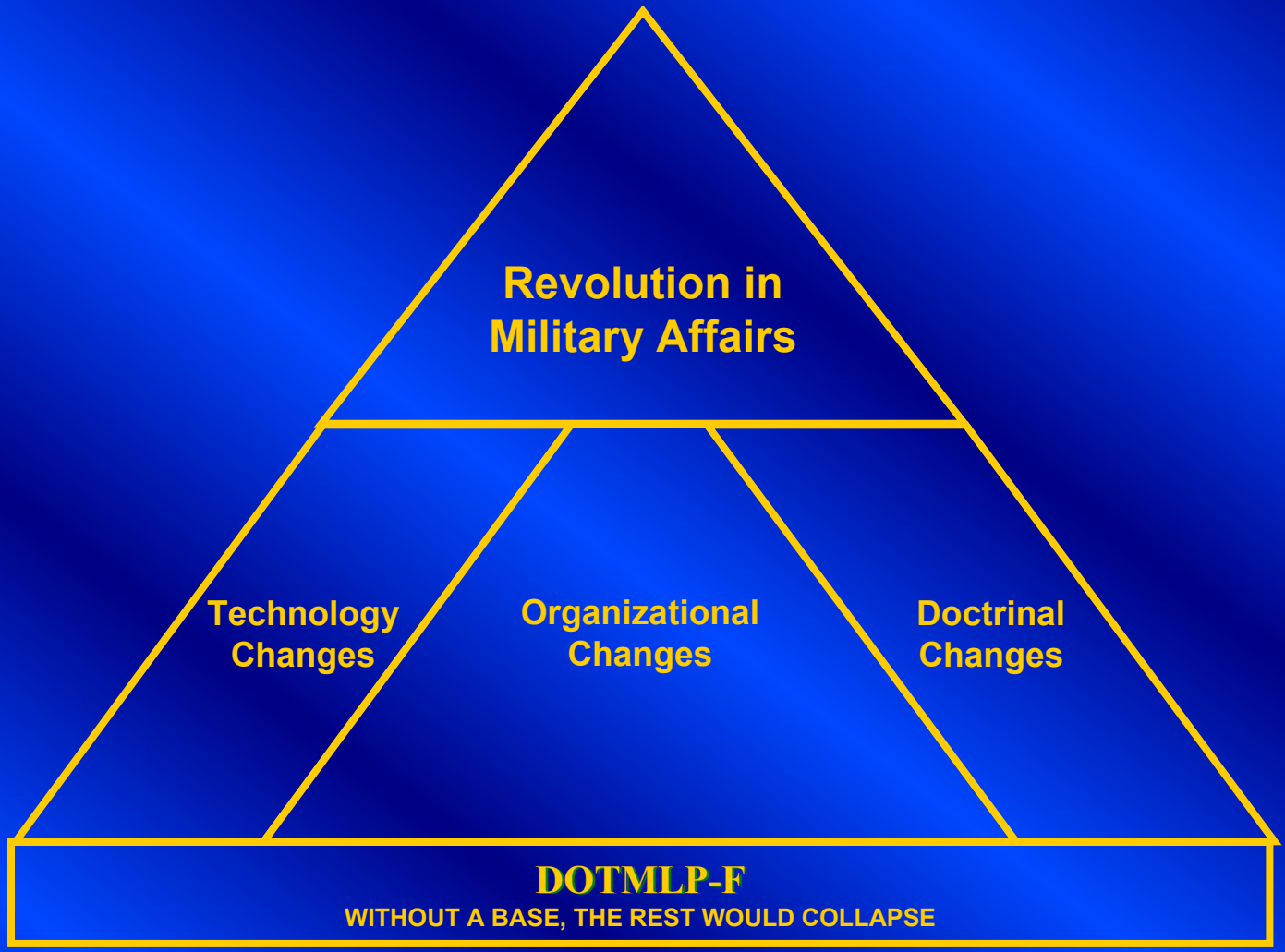
WHAT MAKES RMA?



OTT PROGRAM CHARACTERISTICS

- **Statutorily Based (Title 10)**
  - **Annual Reports to Congress - Activities of the Office of Technology Transition and associated Programs**
- **DoD 5000-Series Emphasis on Evolutionary Defense Acquisition & Technology Maturation**
- **Participation on Multiple IPTs or IPT-Like Groups**
  - **OSD, DoD-wide, Industry, Other Gov't Agencies**
- **Sponsor Conferences, Workshops, & Symposia**

Enable Technology Transition & Transfer Between DOD and Industry

The Need for Transformation

"The United States will … transform America's national security institutions to meet the challenges and opportunities of the twenty-first century."

President George W. Bush,
September 2002

"The Department currently is pursuing transformational business and planning practices such as adaptive planning, a more ***entrepreneurial, future-oriented capabilities- based resource allocation process, accelerated acquisition cycles built on spiral development, out-put based management,*** and a reformed analytic support agenda."

Secretary of Defense Donald Rumsfeld,
Transformation Planning Guidance
April 2003

DoD Leadership's Intent For DoD 5000 Revision

"….create an acquisition policy environment that fosters efficiency, flexibility, creativity, and innovation."

DEPSECDEF Paul Wolfowitz, 30 Oct 2002

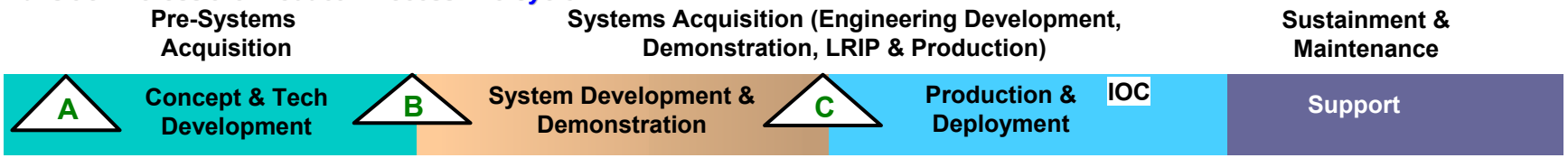
Revised Policy Objectives

- **Encourage innovation and flexibility**
- **Permit greater judgment in the employment of acquisition principles**
- **Focus on outcomes vice process**
- **Empower PM's to use the system vice being hampered by over-regulation**

DDR&E / DUSD (AS&C) Transition Programs

http://www.dod.mil/ddre/
http://wwwosd.acq.osd.mil/asc/

Transition Across the Product / Process Life Cycle



ACTDs

Joint Warfighting Program (JWP)

Technology Transfer Initiative (TTI)

Defense Acquisition Challenge Program (DACP)

Foreign Comperative Testing (FCT))

Dual Use Science & Technology - DUS&T

Independent Research & Development

Tech Link

Quick Reaction Fund (QFR)

Manufacturing Technology - ManTech

Title III / Defense Production Act

Small Business Innovative Research - SBIR

OTT Cog

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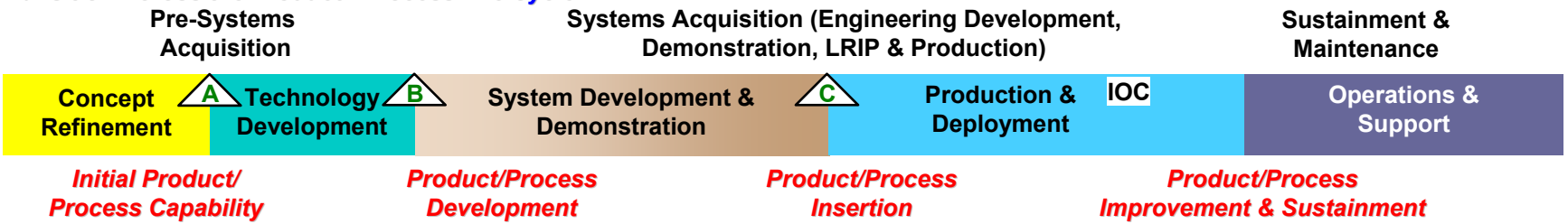

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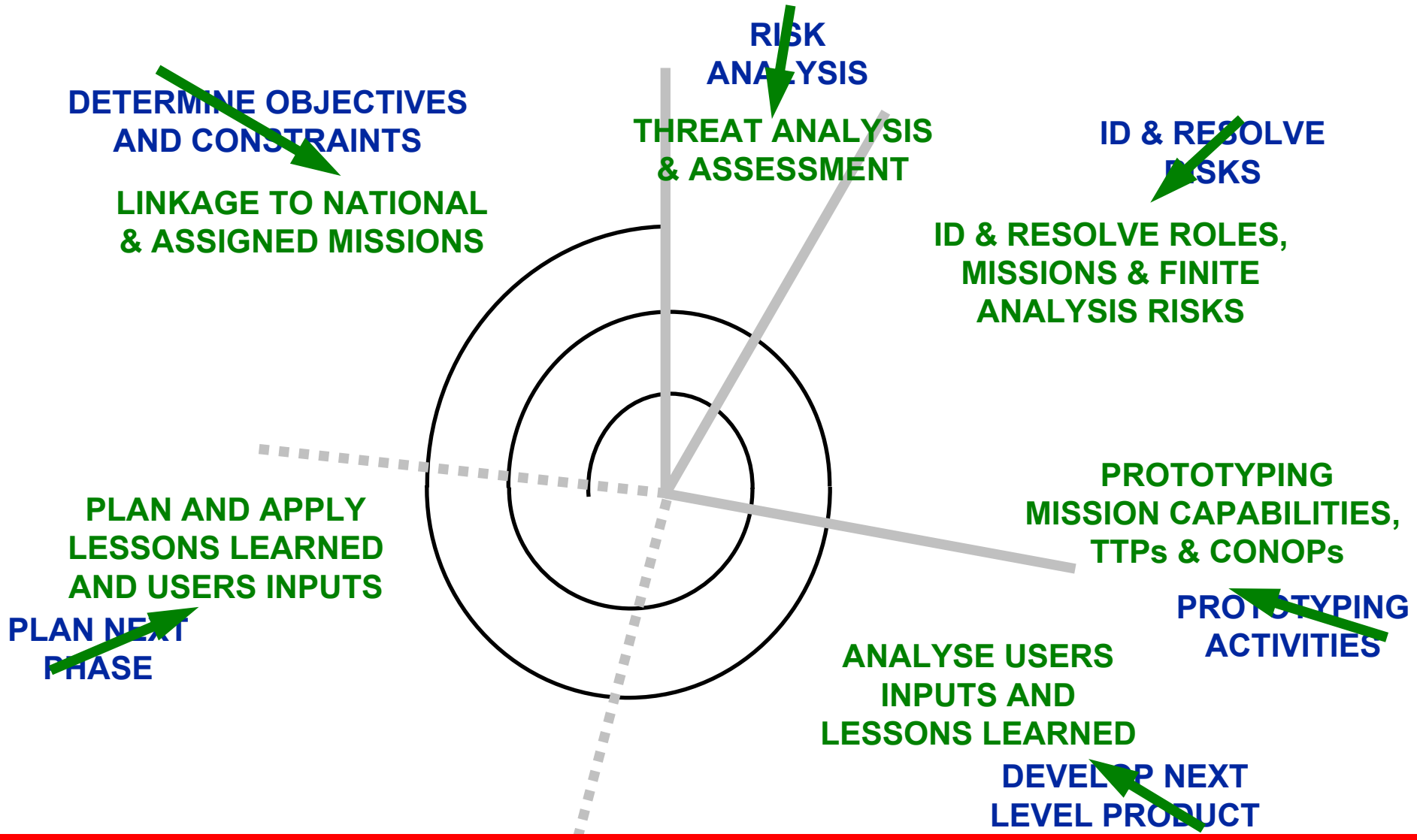
- *Small Business Innovative Research - SBIR*
- *OTT Cog*

SPIRAL METHOD OF OPERATIONAL ENGINEERING



USER INVOLVEMENT & JOINT DISTRIBUTED ENGINEERING PLANT CAN REDUCE THE FIELDING CYCLE TIME TO FIELD OPERATIONAL WARFIGHTING CAPABILITY

TECHNOLOGY TRANSFER

Objective: **To ensure full use of the result of the Nation's Federal investment in R&D - Office of Technology Transition established to encourage, coordinate DoD technology transfer.**

Program Attributes

- **Mechanisms: CRADA, PLA, EPA, and partnering**
- **Normal contracting rules do not apply**
- **Joint development for military and commercial applications**

Example: Watertight Hatch Gasket

- **Newly developed, improved, and patented Si rubber gasket with new cross-section.**
- **Suitable for use in watertight, airtight, and even firezone application closures.**
- **Adopted by entire Navy Fleet AND USCG**
- **Impacts: 90% labor savings on install; cost savings ~$18/linear foot; >1,000,000 ft installed; development cost (with testing) ~$18,000.**
- **Increased service life and ship / vessel survivability.**

Making Mutual Transfer of Technology and Joint Development Normal Business

COMMERICAL OPERATIONS & SUPPORT SAVINGS INIATIVE (COSSI)

Background:

- *Established by FY98 Authorization Act*
- *Uses Other Transaction Authority*
- *Endorsed by DSB Study on "Preserving a Healthy & Competitive Defense Industry"*
- *O&S savings in excess of $5 billion*

Purpose:

- *Provide funding for the nonrecurring engineering, testing, & qualification needed to insert a commercial technology into a legacy system*
- *Increase readiness and reduce operations and support costs of legacy systems*

Example: Helicopter Integrated Mechanical Diagnostic - Health & Usage Monitoring System

- ***Issue:*** **Current Diagnostics are Done Manually - Labor Intensive, Inexact, Leading to Unnecessary Removals**
- ***Solution:*** **Adapt Commercial System that Automatically Collects & Analyzes In-Flight Data**

Leveraging Commercial Technologies to Reduce Operations and Support Costs

DUAL USE SCIENCE & TECHNOLOGY (DUS&T)

***Objective** - Partner with Industry to Jointly Fund the Development of Dual Use Technologies Needed to Maintain DoD's Technological Superiority on the Battlefield & by Industry to Remain Competitive in the Marketplace*

Key Tenets:

- **Cost sharing between the Military Services & Industry (Traditional and Non-Traditional)**
- **Use of "Other Transactions" in lieu of standard contracting to attract commercial firms**
- **Formation of partnerships with industry to develop dual use technologies**

Example: Thermal Spray Nanostructured Coatings For Wear, Corrosion, and Erosion Resistant Applications

To Date: Over 300 Projects Initiated and Close to $1B Invested and More than 400 companies, universities, and nonprofit organizes participating

INDEPENDENT RESEARCH & DEVELOPMENT (IR&D)

DoD/Industry Interaction

DoD		Industry
Provide information on DoD's R&D activities & plans, mission needs, & operational requirements	⇒	Plan, fund, and conduct IR&D
Review IR&D activities and provide feedback to contractors	⇔	Provide technical information about IR&D
Review IR&D database to identify IR&D of interest	⇐	Provide IR&D project descriptions

Example: Inertial Measurement Unit

- Project Cost: ~$10 Million
- Performance demonstrated in > 20 Systems
- Increased sales > 10-fold; Unit price reduced > 2/3s
- HG1700 annual Sales: ~$100 Million & rising

Potential Joint Development Efforts Through Joint Identification of Mutual Interest Areas

MANUFACTURING TECHNOLOGY (ManTech)

Objective: **Improve Affordability of DoD Systems by Investing in New & Improved Manufacturing Processes Across The Weapon System Life Cycle**

Program Attributes

- **Improve Cycle Time & Process Capabilities**
- **Demonstrate Key Information Technologies**
- **Adopt Commercial Practices for Military Applications**

Example - Enhanced Manufacturing Processes for Body Armor Materials

Plate Forming:
Siliconized Silcon Carbide

Plate Forming:
Boron Carbide

Interceptor Body Armor Jacket

- ***Benefits:***
  - **Stops Rifle & Machine Gun Fire**
  - **55% Lighter, 60% Lower Cost Compared to Armor Plates**
  - **Cost Avoidance: $193M**
- ***Implementation:***
  - **Over 50K Plates Delivered & Fielded; 140K Plates on Contract**
  - **Supports "Operation Enduring Freedom"**

Reduced Total Ownership Costs Through Strategic Manufacturing Investments

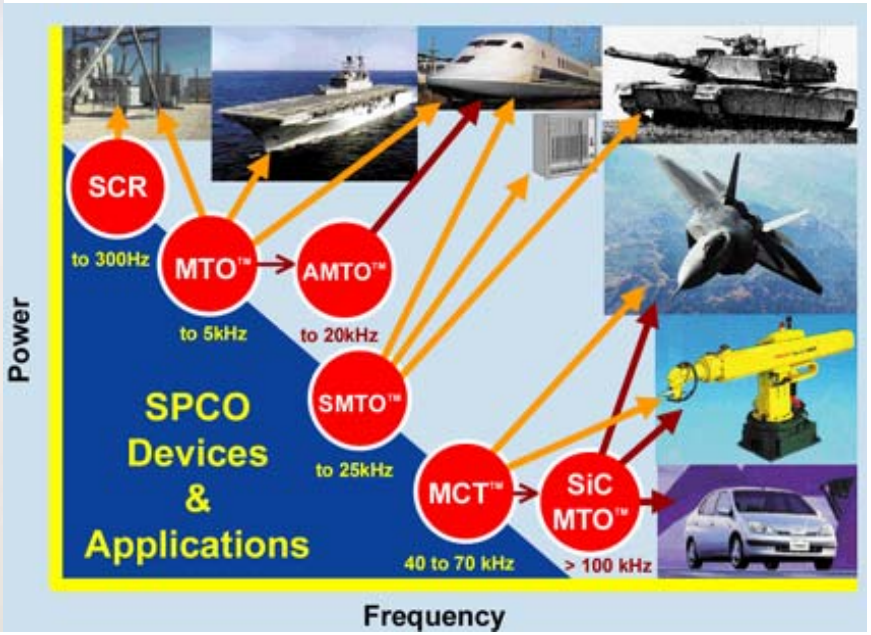
TITLE III / DEFENSE PRODUCTION ACT

Purpose: Create, expand, modernize, and maintain domestic production capacity for essential items and industrial resources needed for national defense

***Incentives to Industry*:**

- DoD shares cost of capital investments
- Process improvements
- Material qualification
- Purchase commitments

Example – Power Semiconductor Switching Devices



Title III – A Driving Force Behind Turnaround in Critical Industry Segments

SMALL BUSINESS INNOVATION RESEARCH (SBIR)

- Stimulates Technological Innovation
- Increases Small Business Participation in Federally Funded R&D
- Encourages Commercialization of Technology

FY01 Funding

- **Federal Agencies: $1.1B**
- **DoD: >$500M**
- **DUSD(S&T): $26M**
  - **Cognitive Readiness**
  - **Advanced Distributed Learning**
  - **Smart Sensor Web**
  - **Biomedical Programs**

Program Phases

- ***Phase I:*** **Six months/$100,000 (feasibility study)**
- ***Phase II:*** **Two years/$750,000 (prototype development)**
- ***Phase III:*** **Commercialize for military & private sector markets**

- ***Example: Acoustic Mouthpiece Using Terfenol-D***
  - **Low Voltage Transducer Embedded Inside a SCUBA Diver's Mouthpiece**
  - **Allows Diver to Hear Through Dental Sound Conduction**
  - **Capability Will Be Available for Special Forces Divers Without Full Face Masks**

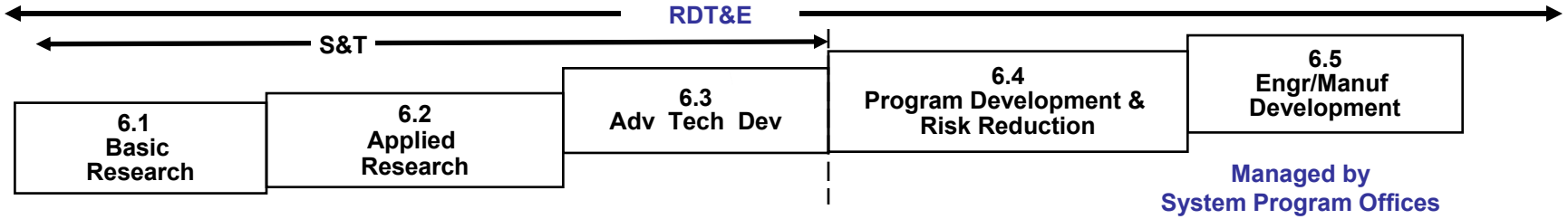
Congressional Interest: 3000 Contracts / Year with Small High Tech Firms

AFFORDABILITY & TRANSITION

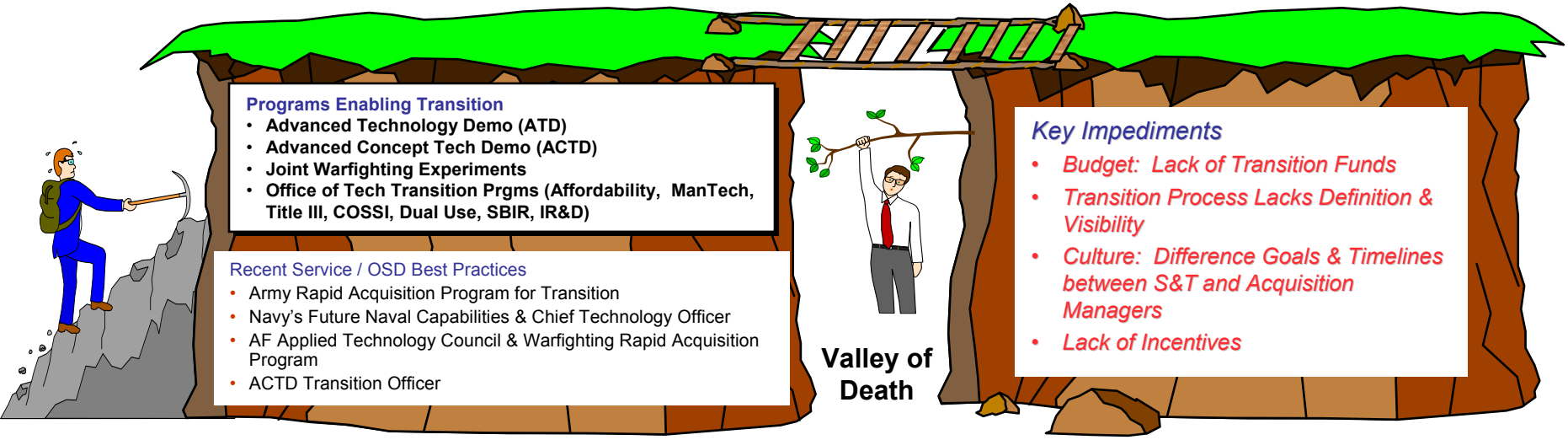
- THE CHALLENGE -

Acquisition Community - "Perceptions" of the S&T Community

- S&T's job is complete at the tech development stage
- Implementation of the technology is the customer's (problem) responsibility
- Development cycle for S&T is too long
- Focus only on the technology and not on the business rationale for implementation



Technology Transition "Seam"



Source: April 2000 PEO SYSCOM Workshop

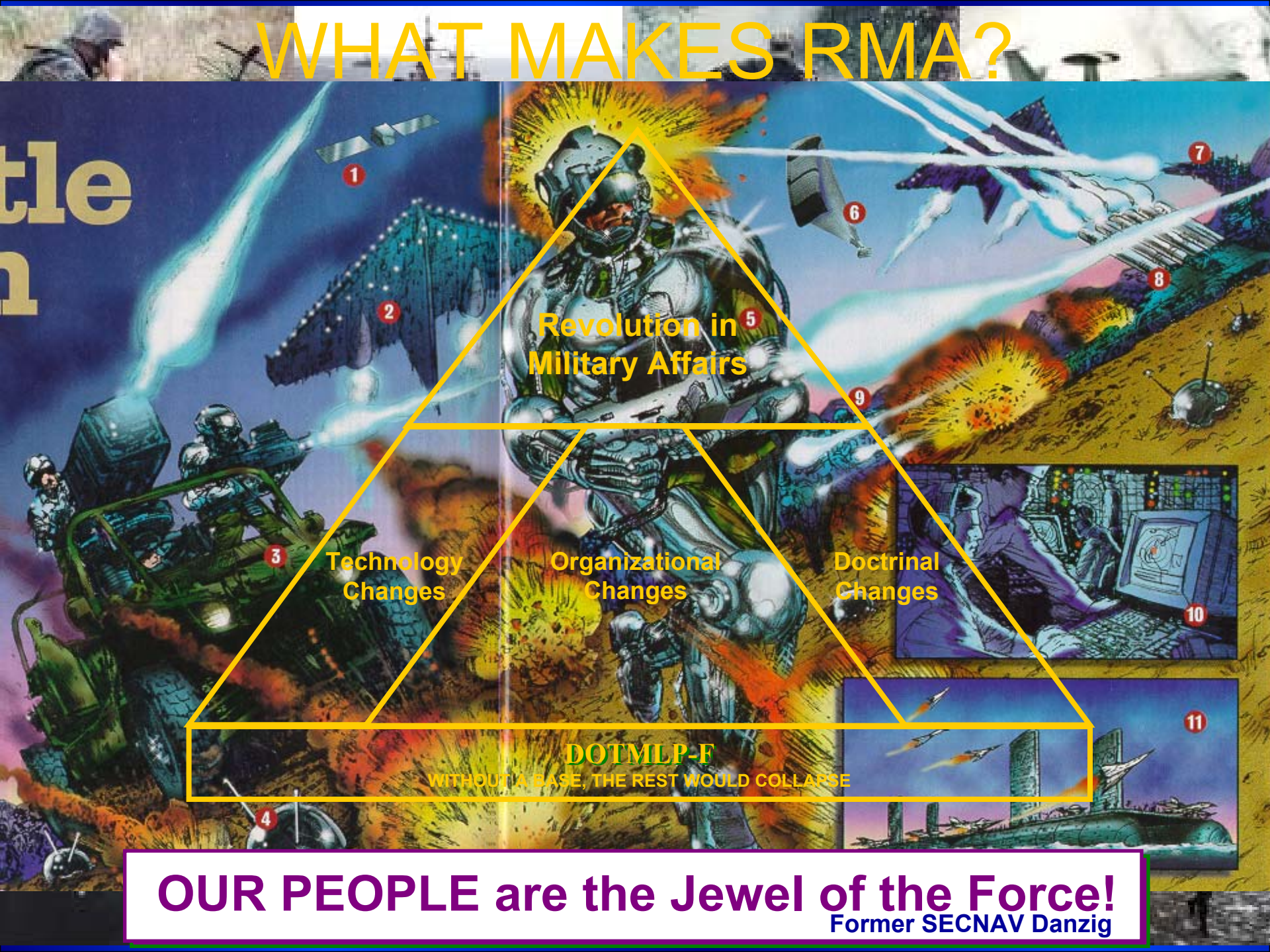
RECOMMENDATIONS

- Establish a Skunkworks Champion and use some Skunkworks within the organization work force.
- Have a Director of Revolution for shifting organization personnel.
- Make submissions of proposals for technology transition programs a performance factor.
- Have Warfighters and Combatant Commanders evaluate Program Managers and Program Manager Organization.

Bottom Line: Warfighter Confidence & Affordable, Faster Transition

Right Materiel, Right Place, Right Time, at the Right Cost - ***All The Time***

WHAT MAKES RMA?



OUR PEOPLE are the Jewel of the Force!

Former SECNAV Danzig