



Acquisition Research Program: Creating Synergy for Informed Change



*9th Annual Acquisition Research Symposium
May 16 - 17, 2012*

Panel 14

Front End Systems Engineering

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Front-End System Engineering

Chair: Michael McGrath, VP for Systems and Ops Analysis, ANSER

1. *The Macro Dynamics of Weapon System Acquisition: Shaping Early Decisions to Get Good Outcomes*

Edward Kraft, Arnold Engineering Development Center

2. *An Experience Accelerator for the Engineering Workforce*

Jon Wade, Stevens Institute of Technology

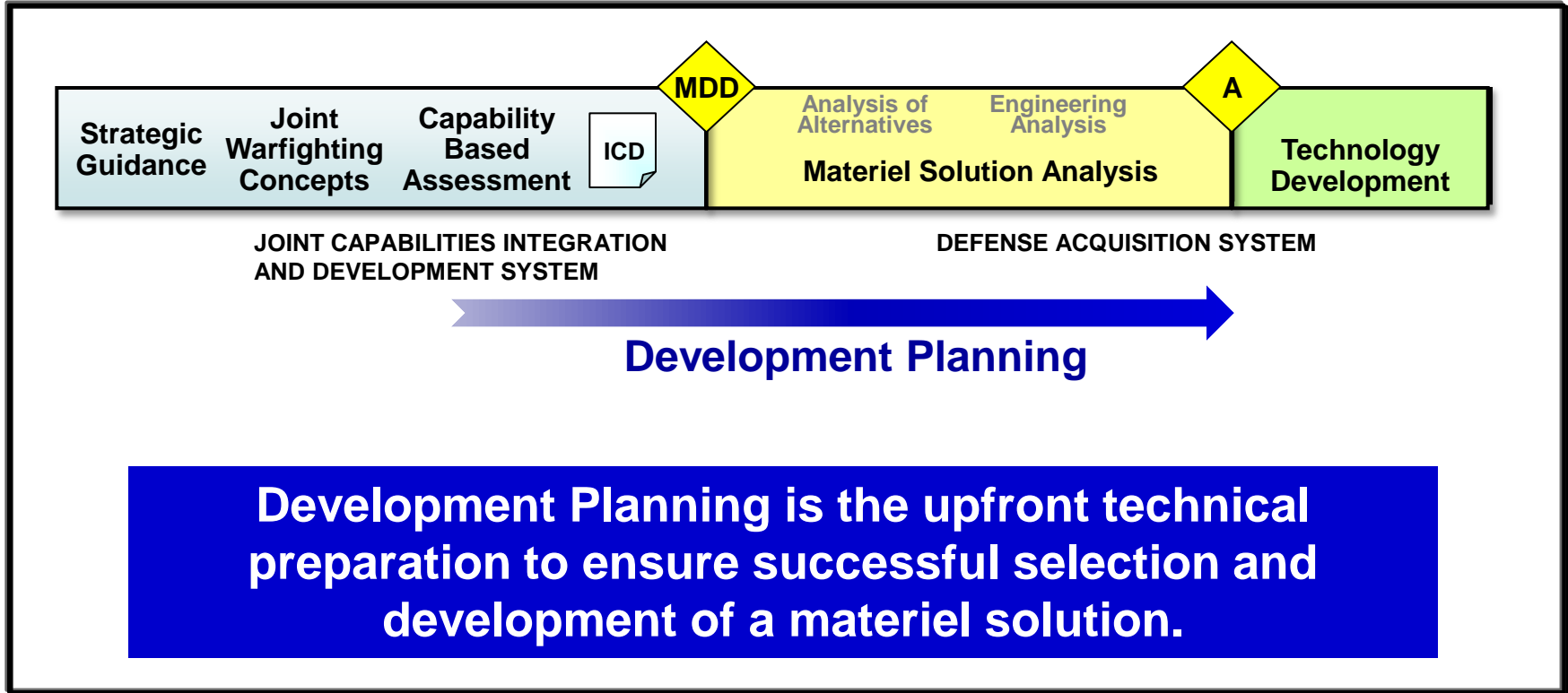
3. *From Today's Tools and Practices to Tomorrow's Investments: New Directions in Systems Engineering*

Robert Neches, Office of the DASD for Systems Engineering

Co-authors: James Carlini, Robert Graybill, Robert Hummel and Michael McGrath



Front End Systems Engineering



1st Panelist: Ed Kraft

*The Macro Dynamics of Weapon System Acquisition:
Shaping Early Decisions to Get Good Outcomes*



Preparing the Engineering Workforce



Systems Engineering Research Center (SERC) A UARC with 22 Collaborating Universities



2nd Panelist: Jon Wade
*An Experience Accelerator
for the
Engineering Workforce*



New Tools and Practices For Front End SE



SECDEF Memo 19 Apr 2011



SECRETARY OF DEFENSE
1000 DEFENSE PENTAGON
WASHINGTON, DC 20301-1000

APR 19 2011

MEMORANDUM FOR SECRETARIES OF THE MILITARY DEPARTMENTS
CHAIRMAN OF THE JOINT CHIEFS OF STAFF
UNDER SECRETARY OF DEFENSE FOR ACQUISITION,
TECHNOLOGY AND LOGISTICS
ASSISTANT SECRETARY OF DEFENSE FOR RESEARCH
AND ENGINEERING
DIRECTORS OF THE DEFENSE AGENCIES

SUBJECT: Science and Technology (S&T) Priorities for Fiscal Years 2013-17 Planning

The Department's S&T leadership, led by the Assistant Secretary of Defense for Research and Engineering, in close coordination with leadership from the Under Secretary of Defense for Policy, the Assistant Secretary of Defense for Nuclear, Chemical, and Biological Defense, the Deputy Assistant Secretary of Defense for Manufacturing and Industrial Base Policy, and the Joint Staff, has identified seven strategic investment priorities. These S&T priorities derive from a comprehensive analysis of recommendations resulting from the Quadrennial Defense Review mission architecture studies directed in the FY12-16 Defense Planning Programming Guidance.

The priority S&T investment areas in the FY13-17 Program Objective Memorandum are:

- (1) **Data to Decisions** – science and applications to reduce the cycle time and manpower requirements for analysis and use of large data sets.
- (2) **Engineered Resilient Systems** – engineering concepts, science, and design tools to protect against malicious compromise of weapon systems and to develop agile manufacturing for trusted and assured defense systems.
- (3) **Cyber Science and Technology** – science and technology for efficient, effective cyber capabilities across the spectrum of joint operations.
- (4) **Electronic Warfare / Electronic Protection** – new concepts and technology to protect systems and extend capabilities across the electro-magnetic spectrum.
- (5) **Counter Weapons of Mass Destruction (WMD)** – advances in DoD's ability to locate, secure, monitor, tag, track, interdict, eliminate and attribute WMD weapons and materials.
- (6) **Autonomy** – science and technology to achieve autonomous systems that reliably and safely accomplish complex tasks, in all environments.
- (7) **Human Systems** – science and technology to enhance human-machine interfaces to increase productivity and effectiveness across a broad range of missions.



OSD 02073-11

S&T Priorities for FY 2013-17

Complex Threats

Electronic Warfare / Electronic Protection
 Cyber Science and Technology
 Counter Weapons of Mass Destruction

Force Multipliers

Autonomy
 Data-to-Decisions
 Human Systems

Engineered Resilient Systems

3rd Panelist: Bob Neches
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