



Panel on Rapid / Expedited Systems Engineering

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“Urgent” is Becoming “Normal”

- Stakeholders /Research points to “Urgent” as the new “Normal”
 - More than 20 rapid-reaction programs and organizations addressing DOD urgent warfighter needs, with over \$50 billion spent on urgent needs between 2005-2009

Research/Report	
DOD’s Urgent Needs Processes Need a More Comprehensive Approach and Evaluation for Potential Consolidation	GAO, March 2011
Improvements to DOD’s Urgent Needs Processes Would Enhance Oversight and Expedite Efforts to Meet Critical Warfighter Needs	GAO, April 2010
Rapid Capability Fielding Toolbox Study: Standard acquisition process not designed to respond to dynamic environments	DDR&E, March 2010
Fulfillment of Urgent Operational Needs	Defense Science Board Task Force, July 2009

Growing Acquisition Expectations

Quadrennial Defense Review 2010: “..the Dept needs a means to quickly prioritize and quantify requirements and to insure that the resources are available to enable rapid fielding of capabilities inside the Dept’s PPBES cycle” --Feb 2010

Sec Gates: “... is this activity or arrangement the best use of limited dollars, given the pressing needs to take care of our people, win the wars we are in, and invest in the capabilities necessary to deal with the most likely and lethal future threats?” --May 2010

Dr. Carter: “Obtain greater efficiency & productivity in defense spending...” --Sep 2010

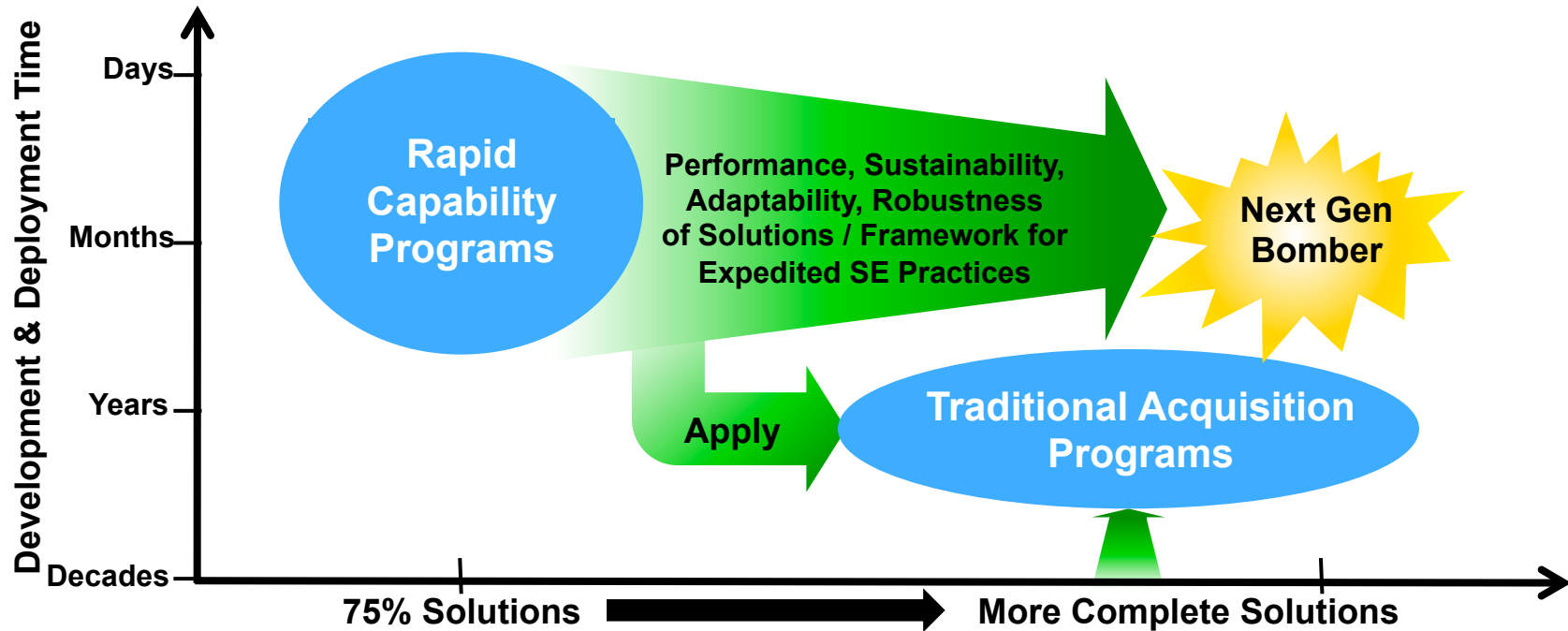
Gen Petraeus: “All of our processes have to be much more rapid and much more responsive to meet the needs of those who are down range, putting it all on the line for our country...” --Jan 2010

Air Force Secretary , Michael Donley on the Next Generation Bomber :
“...what we have determined will be a more streamlined management process going forward, where we are using the Rapid Capabilities Office (RCO) to help manage this project”

Expedited Systems Engineering: RT-34

- Sponsor: Secretary of the Air Force, Acquisition, Science, Technology and Engineering (SAF/AQR)
- 3-phase, 9 month project, with 4th to follow with separate funding
- Collaboration with SERC Universities, the SERC Research Council, Air Force Center for Systems Engineering, and SAF/AQRE
 - Principal Investigator (PI)= Stevens, Co-PI = Air Force Institute of Technology
- Leverage SERC research and models, processes and tools

Expedited SE Research Objective



- Explore and develop scalable expedited SE framework
 - i.e., utilize rapid acquisition procurement but w/intent of more traditional lifecycle for deployment, maintainability, reliability, adaptability and sustainment.
- Framework will examine scaling of SE activities in response to different development constraints

RT-34 Research Phases

- **Phase 1: (Short Planning Phase)**
 - Identify organizations practicing expedited systems engineering
 - Visit selected organizations
 - Incorporate input from the SERC Research Council
- **Phase 2: (Analyze and Develop)**
 - Analyze current state of the art in Expedited SE w/in DoD and commercial sector
 - Develop framework for scaling SE activities in response to different development constraints...such as reduced development time.
- **Phase 3: (Pathfinder Plan Development)**
 - Prepare a plan for validating framework on a DOD acquisition program.
- **Phase 4 (Future, Separate Funding):**
 - Execute Phase 3 Plan
 - Conduct research to analyze the framework in action...iterate the framework based on observations and results as applied to a real program.

The Human Role of SE

- SE Process/ Control -> Facilitator/ Team Empowered
- Separate SE organization -> SE systemic throughout Team
- Product Design -> Team Design
- Possibility of Task Automation -> Innovation, Responsive Decision Making
- Risk Aversion -> Managed Risk



Annual SERC Research Review, October 5-6, 2011



What's More Effective?



RT-34 Phase 1 Activities

- RT Kickoff Telecon: 13 Sep 2011 (SERC Research Council)
- Literature Review started
- Drafted Site Visit investigative questions on Success Factors
 - SE methods, processes, and tools
 - Project Lifecycle Scope
 - Team Aspects
 - Decision Analysis
 - Scalability of Success Factors
 - Collaboration
- Site visits
 - Tour Aerospace Corp Concept Design Capability
 - Tour Northrop-Grumman Futures Lab
 - Planning for Additional Site Visits with Diverse Team

Panelists

- Mr. G Richard Freeman – *Technical Director, Air Force Center for Systems Engineering, Air Force Institute of Technology*
- Dr. Peter G. Ifju – *Professor of Mechanical & Aerospace Engineering, Univ of Florida*
- Dr. Neil Siegel – *Vice President & Chief Engineer, Information Systems Sector, Northrop Grumman Corp.*
- Dr. Richard Valerdi – *Associate Professor, Department of Systems & Industrial Engineering, University of Arizona*

Panel Member Questions

- What are your top 3 Critical Success Factors for Expedited Systems Engineering
- What role does Systems Engineering play in Expedited projects
- Discuss importance of both Process and Team
- What are the Major Constraints to implementation
- What are the major challenges and opportunities for current and future DoD projects in the are of rapid/expedited systems engineering
- What one piece of advice would you give for this research

How You Can Help

- Appreciate contact points for organizations/people practicing rapid acquisition/deployment (academic, defense, commercial)
- Welcome your ideas and support for identifying pathfinder programs
- Opportunity to collaborate

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