Prototyping: A Path to Agility, Innovation and Affordability

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Strategic Environment

Strategic Guidance
- Quadrennial Defense Review 2014
- Better Buying Power 3.0 September 2014
- Defense Innovation Initiative November 2014
- DoDI 5000.02 January 2015
- Long-Range Research and Development Program Plan (LRRDPP) January 2015

Challenges
- Operational / Mission
- Cultural
- Fiscal
- Technology Globalization

Prototyping and Experimentation
- AGILITY
- INNOVATION
- AFFORDABILITY

Methodology
- Capability Shortfall
- Problem Definition
- Decompose Problem
- Define Solution Options
- Prototype
- Assessment

Categories of Prototypes
- Proof of Principle
  - TRL 1 - 4
  - TRL 5-6
  - TRL 7
  - TRL 8-9
- Pre-EMD
- Fieldable
EC&P Prototyping Selection Process

Designed to identify, develop, and demonstrate multi-domain technologies / concepts to satisfy Department / Multi-Service / COCOM highest priorities

Focus areas for FY 15-17

- Electromagnetic spectrum agility
- Autonomous systems
- Space capability resilience
- Asymmetric force application
Electromagnetic Spectrum Agility: Capabilities that allow Department of Defense (DoD) forces to operate with freedom of maneuver in the electro-magnetic spectrum (EMS). Operations include:

- Gaining and attaining access to spectrum for friendly forces, denying and/or degrading spectrum to our adversaries
- Conducting EM deception operations to degrade an adversary’s understanding of our intent and capability
- Otherwise preventing the adversary from leveraging the EM domain to conduct operations in other domains (i.e., air, space, maritime, land and cyber)
- New effects in the EMS domain to include directed energy and radio frequency disruption

Focus Area Lead: Mrs. Ellen Purdy
Autonomous Systems:

• Capability that enables a particular action of a system to be automatic or, within programmed boundaries, or ‘self-governing’

• Important for mobile unmanned systems that must maneuver in an environment with little or no human assistance, or systems that aid human cognitive tasks, including:

  – Target recognition and systems that aid the human in the coordination of multiple sensors and multiple weapons to support the completion of blue, and the defeat of red, detect-to-engage sequences
  – Improving capability without increasing capacity by better coordinating and synchronizing current sensors and weapon systems, while maximizing the combat efficiency of both
  – Combing through large volumes of Intelligence, Surveillance and Reconnaissance (ISR) data, and notify the analyst of pattern of life anomalies or other data that meets user-specified criteria

Focus Area Lead: Mr. Fritz Schulz
Space Capability Resilience:

- Responds to a sophisticated adversary’s attempts to deny us access to our space-based capabilities and adverse space conditions that degrade our space-based capabilities
- Resilient response includes:
  - Taking proactive and reactive defensive measures (Avoidance)
  - Designing systems with enhanced survivability features (Robustness)
  - Conducting operations to replenish lost or diminished capacity (Reconstitution)
  - Help re-establish space capability and capacity (Recovery)
  - Subsystems and activities that support any systems architecture able to achieve effects normally associated with current space systems

Focus Area Lead: Mr. Tim Boudreaux
Asymmetric Force Application:

- Use of non-traditional technologies, tactics, and weapons to provide a clear military advantage to our forces during maneuver and engagement operations
- Solutions will reduce U.S. reliance on overleveraged blue capabilities and creatively exploit increasingly capable adversary systems while adjusting the cost curve in our favor
- Of particular interest are applications that provide an innovative technology offset and / or cost calculus advantage
- Includes technologies needed for - -
  - Countering threats associated with integrated air defense systems
  - Long range penetrating strike
  - Offensive and defensive air superiority operations

Focus Area Lead: Dr. Bill Humbert
EC&P Timeline
FY15–16

Studies and analyses to support FY16-17 cycle

Questions drive studies and assessments to inform the next cycle

Review Strategic Priorities

Focus Areas Document

Ops Problem Decomp

Technical Assessment

EC&P Concepts Review

ASD(R&E) Review

Program Development, Selection, Execution, Review

Program Selection and Approval

Program Selection and Approval

Program Selection and Approval

2Q15

3Q15

4Q15

1Q16
Resources for DoD R&E Enterprise
Defense Innovation Marketplace

Resources for Industry
• DoD Technology Roadmaps and Investment Strategies
  • DoD R&E Strategic Guidance documents are all posted to the Marketplace
• DoD/Service Solicitations
• Virtual Technology Interchanges & Events
• Opportunity to grow and expand DoD relationships / partnerships
• Secure Portal for IR&D Project Summaries

Resources for DOD
• Market Research for approved DoD S&T, R&D and Acquisition professionals:
  • Secure portal with more than 15,000 IR&D Project Summaries
  • Technical Maturity and Surveillance
  • Guide DoD R&E investments
  • Potential for risk / cost reduction
• Opportunity to grow and expand new relationships and partnerships


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