Prototyping: Accelerating the Adoption of Transformative Capabilities

April 12, 2016

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Deputy Assistant Secretary of Defense,
Emerging Capability & Prototyping
What do we mean by Prototyping?

“A set of design and development activities intended to reduce technical uncertainty and to generate information to improve the quality of subsequent decisionmaking.”

– On Prototyping, RAND Corporation, 2009

Prototyping Categories

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Proof of Principle Prototypes
• Art of the possible

Pre-EMD Prototypes
• Ready technology for MS B decision

Fieldable Prototypes
• Prepare for fielding in limited quantities
Why Greater Emphasis on Prototyping?

- Better Buying Power
- Defense Innovation Initiative
- 3rd Offset Strategy
- NDAA FY16
- NDAA FY17 Language
Why Greater Emphasis on Prototyping?

- Constrained Budgets - we cannot afford to procure unique or exquisite systems for every potential threat:
  - Russia, China
  - North Korea, Iran
  - Trans-national Terrorists

- Department’s commitment to Modular Open Systems Architecture (MOSA) and standard interfaces encourage traditional and non-traditional sources of supply to offer subsystem options

- Advanced design and manufacturing tools enable faster and more affordable prototype development

Prototyping advances technology frontiers…
Roles of Prototyping

**Technology**
- Clear a specific technical hurdle
- Explore art of the possible
- Inform requirements process
- Aid technology integration

**Production**
- Offer rapid response to emerging capability shortfalls
- Improve development methods and manufacturing

**Affordability**
- Inform and validate cost estimates
- Leverage the investment of non-traditional and international performers

**Supporting Policies**
- Demonstrate open standards
- Promote competition throughout the product lifecycle
- Stimulate industrial base to advance the state of the practice
DoD Prototyping Priorities

- Autonomy & Robotics
- Data Analytics
- Biomedical
- Electronic Warfare / Cyber
- Future of Computing/Micro-electronics
- Hypersonics
- Directed Energy
- Manufacturing
  - Innovation Centers
  - Engineered Resilient Systems
- Bending the Cost Curve - Affordability
EC&P Lines of Operation

- Counter Emerging Threats
- Enhance Interoperability & Extend the Life of Existing Systems
- Accelerate Adoption of Transformative Capability
Emerging Capabilities Technology Development (ECTD)

- Pursue risk-reducing technology prototypes and demonstrations of cutting edge land, sea, air and space systems for joint and Service users
- Proof-of-Principle prototypes; < 36 months, < $6M
- POC: Mr. Glenn Fogg – glenn.a.fogg.civ@mail.mil

Infrared Motion Detection (IrMD) Using Existing EO/IR Assets

RWS Auto Prioritization, Targeting, and Operator Cueing (RAPTOR)

Spectral Management
Foreign Comparative Test (FCT)

- Evaluate foreign prototype technology to adapt / transition for DoD use
- Pre-EMD prototype and non-development item demonstrations; < 24 months, < $2.5M
- POC: Col Scott Wallace – scott.t.wallace.mil@mail.mil

**Technology**
- Pilot Physiological Monitoring and Warning System
- Soldier Power with Inductive Recharge and Intelligent Textiles

**Aid technology integration**
- Pilot Oxisensor

**Affordability**
- Soldier-Sniper Weapon Observation Reconnaissance Device

**Leverage international performers’ investments**
Joint Capability Technology Demonstration (JCTD)

- Foster innovation, contribute to accelerated acquisition and weapon system affordability while providing the Joint Forces with a decisive technical advantage
- Pre-EMD and Fieldable Prototypes/Demonstrations; < 48 months, < $100M
- POC: Mr. Elmer Roman– elmer.l.roman.civ@mail.mil

Technology

Clear a specific technical hurdle

Affordability

Inform and validate cost estimates

Autonomous Mobility Applique System (AMAS)

High Speed Container Delivery System (HSCDS)

Kestrel Eye
Quick Reaction Special Projects (QRSP)

- Mature emerging technologies for operational use.
- QRF – Conventional warfare needs focusing on A2/AD (ex: IWAS); < 12 months, < $3M
- RRF – Irregular warfare needs with global focus (ex: ANDE); < 18 months, < $1.5M
- POC: Mr. Glenn Fogg – glenn.a.fogg.civ@mail.mil

Offer rapid response to emerging capability shortfalls

- Solid State Neutron Detector (SSND)
- Acoustic Cloaking for Minimizing Target Detection
- Aluminum-Seawater Fuel Cell

Production
Rapid Innovation Fund (RIF)

- Accelerate the fielding of innovative technologies into military systems pursuant to Small Business Innovative Research projects, technologies developed by the DoD labs, and other innovative technologies
- Award preference to small businesses: < 24 months, < $3M
- POC: Mr. Thomas (Dan) Cundiff – thomas.d.cundiff.civ@mail.mil

Technology

- Encapsulated Body Armor
  - w/o Encapsulation
  - with Encapsulation

Aid technology integration

- Port Security Barriers Intrusion Detection System (PIDS)
  - Alarm Panel & Display
  - Cable secured to net detects any breach of barrier or opening of couplings

Explore art of the possible

- Miniature Deployable System for Rapid TBI Screening

Rapid Innovation Fund (RIF)
Focus Areas for 2017

- Asymmetric Force Application
- Electromagnetic Spectrum Agility
- Autonomous Systems
- Information Operations and Analytics
## Summary

### DoD Priorities
- Autonomy & Robotics
- Data Analytics
- Biomedical
- Electronic Warfare / Cyber
- Future of Computing
- Micro-electronics
- Hypersonics
- Directed Energy
- Manufacturing
  - Innovation Centers
  - Engineered Resilient Systems
- Bending the Cost Curve - Affordability

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### Definition

“A set of design and development activities intended to reduce technical uncertainty and to generate information to improve the quality of subsequent decisionmaking.”


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### Roles of Prototyping

- Technology
- Affordability
- Production
- Supporting Policies

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*“It’s tough to make predictions, especially about the future.”*  
Yogi Berra