DoD Research and Engineering

Defense Innovation Unit – Experimental Townhall

Mr. Stephen Welby
Assistant Secretary of Defense for Research and Engineering

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Preserving Technological Superiority

• **US and Allies have been able to count on a decisive technological advantage for more than 40 years**
  – Advantage built on technologies developed by and for the US military
    o Precision weapons, long-range intelligence, surveillance and reconnaissance (ISR), stealth

• **What has changed:**
  – Increasingly global access to resources, technology and talent
  – Competitors investing in capabilities directly designed to counter US technical advantage: tactics, techniques, technologies, procedures
  – Responding to such an environment requires agility and a commitment to invest to keep pace with technical opportunity
  – Drives a focus on cost and cycle time
• In response to this long-term challenge, DoD R&E seeks competitive advantage through innovation…

  – **Leveraging all sources of innovation opportunity:**
    - Academia, Commercial, Defense Industry, Organic (DoD Labs), Global Sourcing (Allies and Partners)

  – **Time to market matters** – Accelerate the Technology Adoption Cycle
    - Out-innovate competitors with access to the same commercial technology base

  – **Speed transition from Laboratory to Fleet**
    - Prototyping, Demonstrations, Operational Experiments
Defense R&E Strategy

1. **Mitigate** current and anticipated threat capabilities
   - Cyber
   - Counter Space
   - Missile Defense

2. **Affordably** enable new or extended capabilities in existing military systems
   - Systems Engineering
   - Capability Prototyping
   - Interoperability

3. Create **technology surprise** through science and engineering
   - Autonomy
   - Human Systems
   - Quantum Systems

**Technology Needs**
- Cyber / Electronic Warfare
- Engineering / M & S
- Capability Prototyping
- Protection & Sustainment
- Advanced Machine Intelligence
- Anti-Access/Area Denial (A2/AD)

Researchers and Engineers doing game-changing work
An Enterprise-Wide Focus on Innovation

• Grow and sustain our S&T capability
  – Defense Innovation Unit-Experimental
  – Speed to Market
  – Prototyping, Demonstrations, and Experimentation
  – Force of the Future
  – Science, Technology, Engineering and Math (STEM)
  – Better Buying Power: Innovation, Technical Excellence, Speed to Market
  – Modular, Open Systems Architecture
Defense Innovation Unit Experimental (DIUx)

- **Three Year Pilot Project designed to:**
  - Build new relationships with High-Tech, Non-Traditional firms.
  - Scout for breakthrough and emerging technologies.
  - Impedance match the needs of the DoD with the fast-moving commercial innovation community.
  - Highly qualified Civilian and Reserve Military experts with first-hand experience in high-tech start-ups.
  - Initial operating location: Silicon Valley

“…creating tunnels of ideas into the Department that haven’t existed before…”

- Bob Work, Deputy Secretary of Defense, DSD Editorial Board, 15 September, 2015
Speed to Market

- Shift our culture to more **rapidly adopt / refresh technology**, transition to operational capability

- **Remove barriers** to commercial technology, increase **international science and technology awareness**

- Focus on **high-payoff technology prototyping** and operational demonstrations

- Pilot **accelerated contracting vehicles** for innovative research and development
  - Streamlined Broad Agency Announcements (BAAs), Other Transactional Agreements (OTAs), Fast Track Acquisition, etc.
  - Leverage new accelerated procurement authorities, venture capital-like
Force of the Future

- **Recruit and retain a workforce** ready to address the technical and operational demands ahead

- A Department *open to ideas* and the *flow of talent* in and out of DoD
  - Talent must not be taken for granted
  - Address generational, technological, and labor market changes
  - Increase permeability of the DoD workforce: Sabbaticals, internships, transitions
  - Continue to attract the talent needed to demonstrate high standards of performance, leadership, ethics, honor and trust
DoD Science, Technology, Engineering and Mathematics (STEM) Efforts

**Mission:** Attract, inspire, and develop exceptional STEM talent across the education continuum and advance the current DoD Science and Engineering workforce to meet future defense technological challenges

- **Communicate:** Growing opportunities to work cutting edge, leap-ahead technologies
- **Inspire:** Young scientists and engineers to consider careers with the Department
- **Cultivate:** Culture of Innovation to sustain our competitive edge
- **Promote:** Diversity and agility of thought
- **Enhance:** Continued professional development and growth
DoD Innovation Strategies

• **Shifting culture** Leaning forward into a complex security environment
  – Technologies, operational and organizational constructs, people

• **Growing organically** Looking externally
  – DoD Laboratories, academia, defense industry, DIUx, global sourcing (allies and partners)

• **Avoid technology surprise** Seeking asymmetric advantage
  – Third Offset Strategy; Robotics, Big Data, Visualization, Microelectronics, Hypersonics, Directed Energy

• **Leveraging new sources of technology** Servicing and expanding core competencies
  – Prototyping, demonstrations, and experimentation; Modular, Open Systems Architecture; Manufacturing Innovation Centers
DoD R&E Enterprise: Pursuing Sustained Technical Advantage


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