Information Analysis Centers (IACs)

Technology Domain Awareness

2015 NDIA Science & Engineering Technology Conference

March 25, 2015

The Changing Face of Defense Innovation

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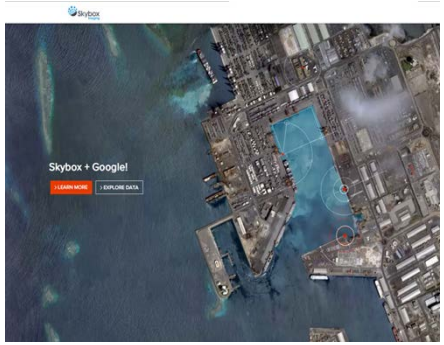

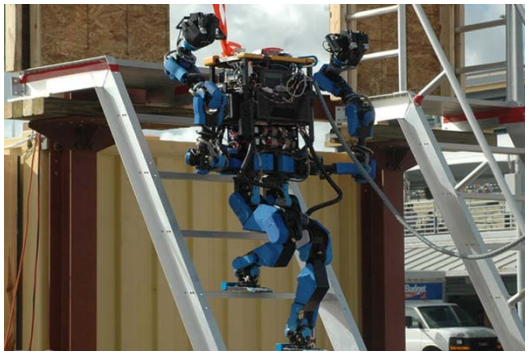

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The Changing Face of Threat

Syrian rebels using iPad for networked, precision, indirect fire

ISIS surveillance footage of the Tabqa airbase in Syria from a commercial DJI Phantom FC40 drone

Asymmetric Technology Trends

Drones Case Study

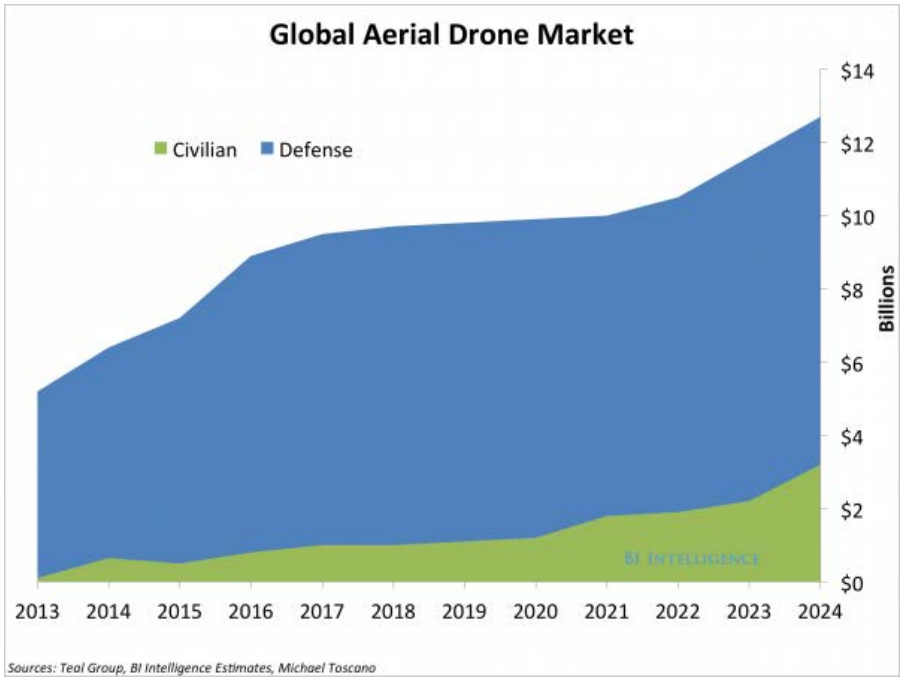
Most growth and investment in the drone industry is taking place in the civilian marketplace

Annual market growth of 19% in the civilian sector (5% military)

Legacy military drone manufacturers do not have a natural advantage in the dynamic civilian drone market

Many notable commercial drone manufacturers are emerging outside of the U.S.

Commercial drone industry has begun seeing major investments from private investors



Business Insider 2015 Drones Market Report

How long will it take for dual-use drone technology to meet or exceed military drone technology?

The Defense Innovation Imperative

Addressing the Challenges of a Changing World

"[W]e are entering an era where American dominance on the seas, in the skies, and in space can no longer be taken for granted"

Former Secretary of Defense Chuck Hagel
February 24, 2014

"[T]he next version of Better Buying Power will focus on the need to access technologies we are not accessing today."

Under Secretary of Defense Frank Kendall
July 10, 2014

"We all know that DoD no longer has exclusive access to the most cutting-edge technology or the ability to spur or control the development of new technologies the way we once did."

Former Secretary of Defense Chuck Hagel
November 15, 2014

"As other nations pursue comprehensive military modernization programs and develop technologies designed to blunt our military's traditional advantages, the first pillar of our future force must be ensuring that we maintain – and extend – our technological edge over any potential adversary."

Secretary of Defense Ashton Carter
March 4, 2015

Innovation Yesterday

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Innovation Today

Technology Domain Awareness

Technology Domain Awareness (TDA) is the effective understanding of the technology landscape as it relates to defense needs.

It provides the (1) networks, (2) knowledge, and (3) business processes required for effective **application-based innovation**.

Technology Domain Awareness

Seeding Application-Based Innovation

PROBLEM | **AVAILABLE TECHNOLOGY** | **APPLICATION**

Constant Hawk

+

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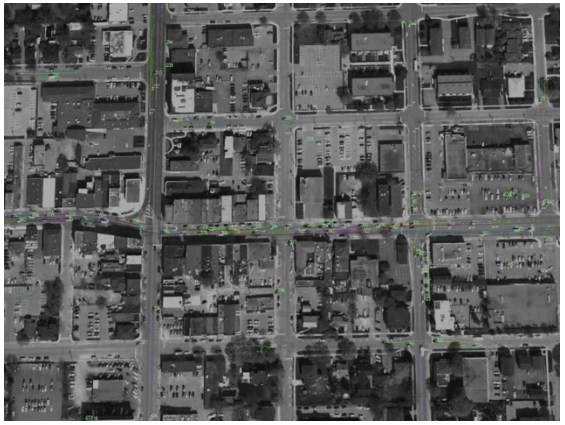


VEHICLE BORN IMPROVISED EXPLOSIVE DEVICES- VBIEDs

LARGE FORMAT MOVIE CAMERA

WIDE-AREA PERSISTENT SURVEILLANCE

Technology Domain Awareness

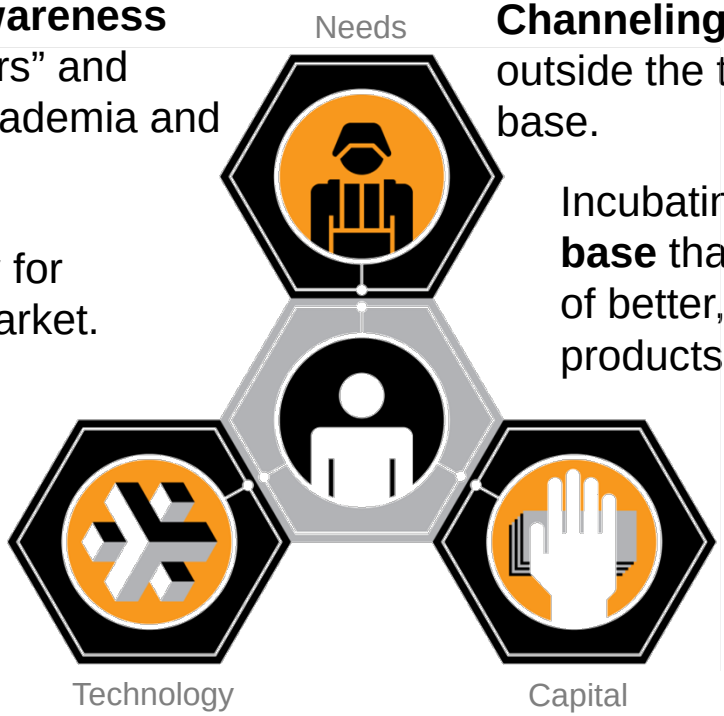
Innovation Platform for Defense

The DOD TDA initiative is a platform of information, services, and infrastructure supporting defense innovation.

Creating **shared market awareness** between defense "consumers" and innovation "producers" in academia and industry.

Lowering barriers to entry for innovation in the defense market.

Aligning technology sources, uses and incentives to create an extended defense innovation ecosystem.



Channeling innovations derived from outside the traditional defense industrial base.

Incubating a **defense innovation base** that supports the development of better, cheaper AND faster products.

Developing an information-based **learning context** for rapid innovation.

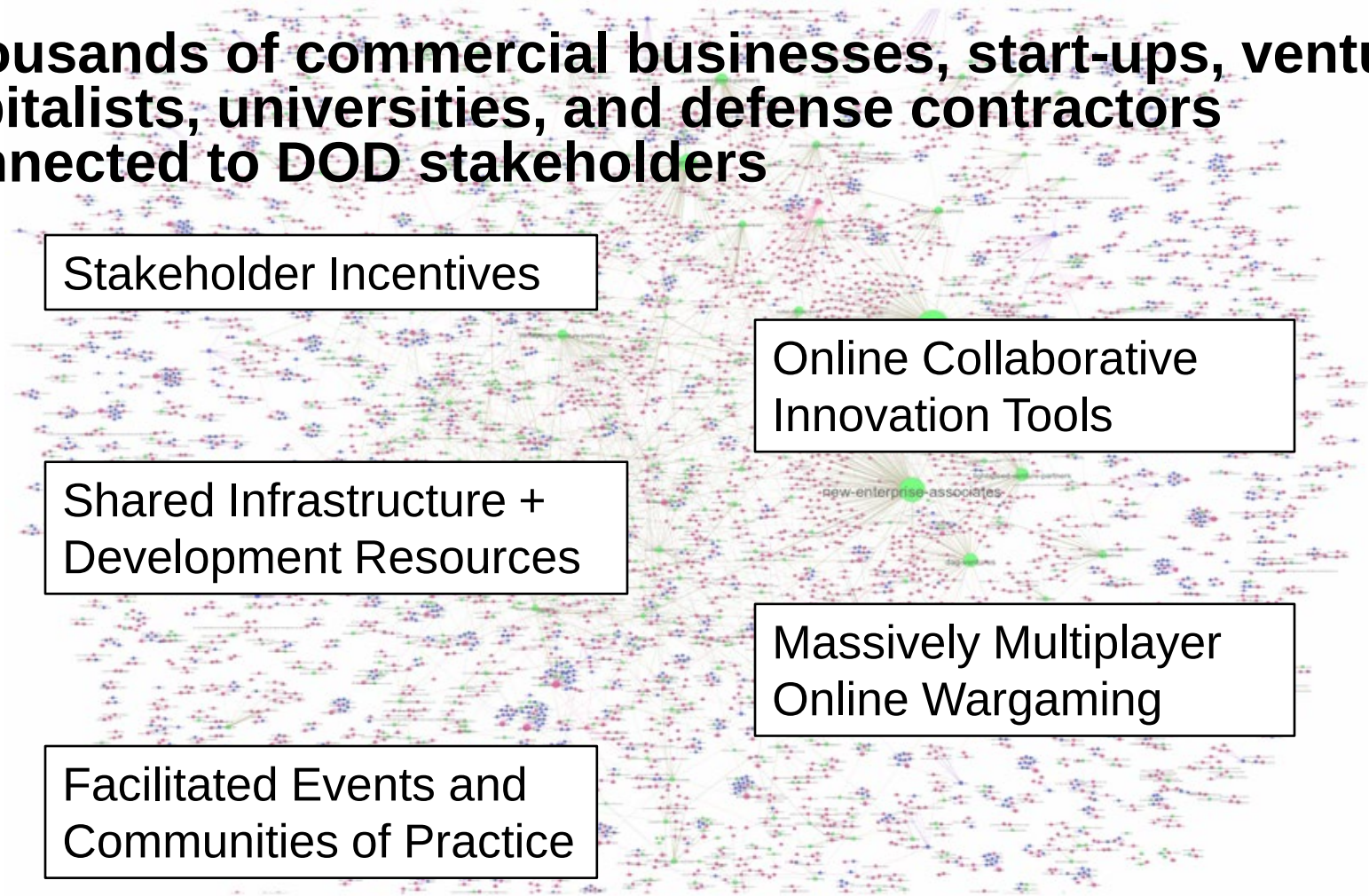
Realizing **economic efficiencies** through co-investment.

TDA links the resources needed to produce application-based innovations

Technology Domain Awareness

Networks: Connecting Problems to Technologies

Thousands of commercial businesses, start-ups, venture capitalists, universities, and defense contractors connected to DOD stakeholders



Stakeholder Incentives

Online Collaborative Innovation Tools

Shared Infrastructure + Development Resources

Massively Multiplayer Online Wargaming

Facilitated Events and Communities of Practice

Technology Domain Awareness

Knowledge: Learning by Doing

Learning from Investment (LFI) – link application-based innovations to long-term decision-making

Prototyping services (infrastructure, expertise, and contracting)

Data collection standards and tools; curated, online knowledge management

Technology lessons learned analysis

Technology scouting + horizon scanning resources

Corporate learning objectives to frame prototyping efforts

"We tend to retry things every ten years or so because we don't remember what happened the last time they were tried…because we don't have any data."

- Frank Kendall

Technology Domain Awareness

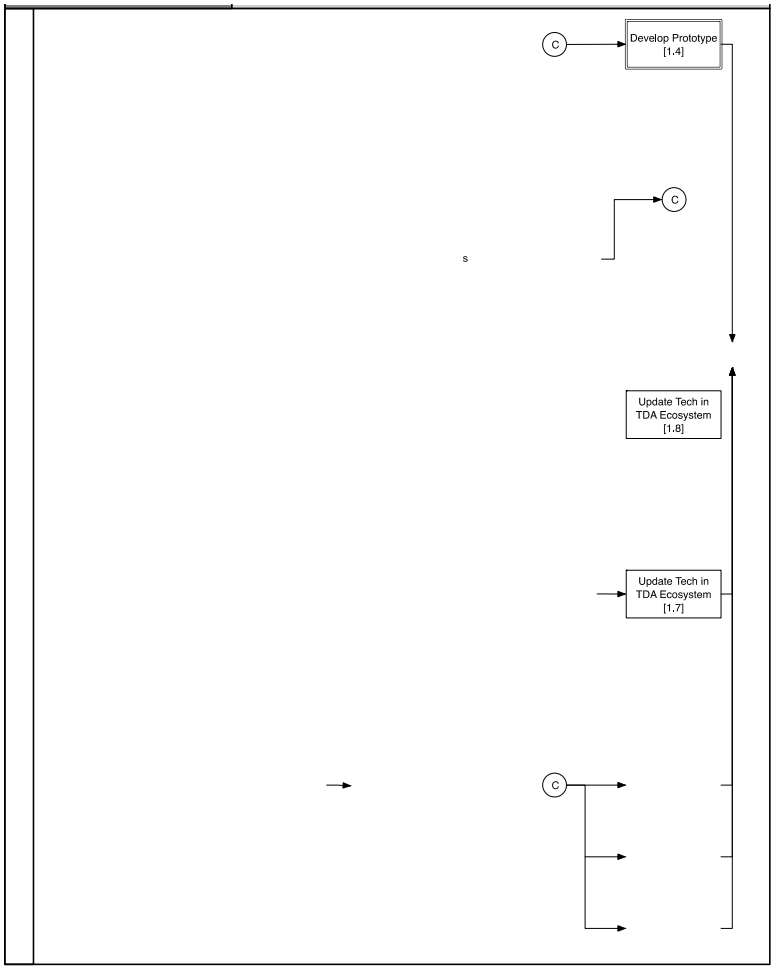
Business Processes

Business Processes – repeatable processes governing the emergence of an extended defense innovation community of practice

Protocols for translating needs to unclassified challenge statements

Processes that link prototyping to DOD requirements development and organizational learning objectives

Business rules for fully engaging the global tech base to support DOD capability needs



TDA Business Process v1.0

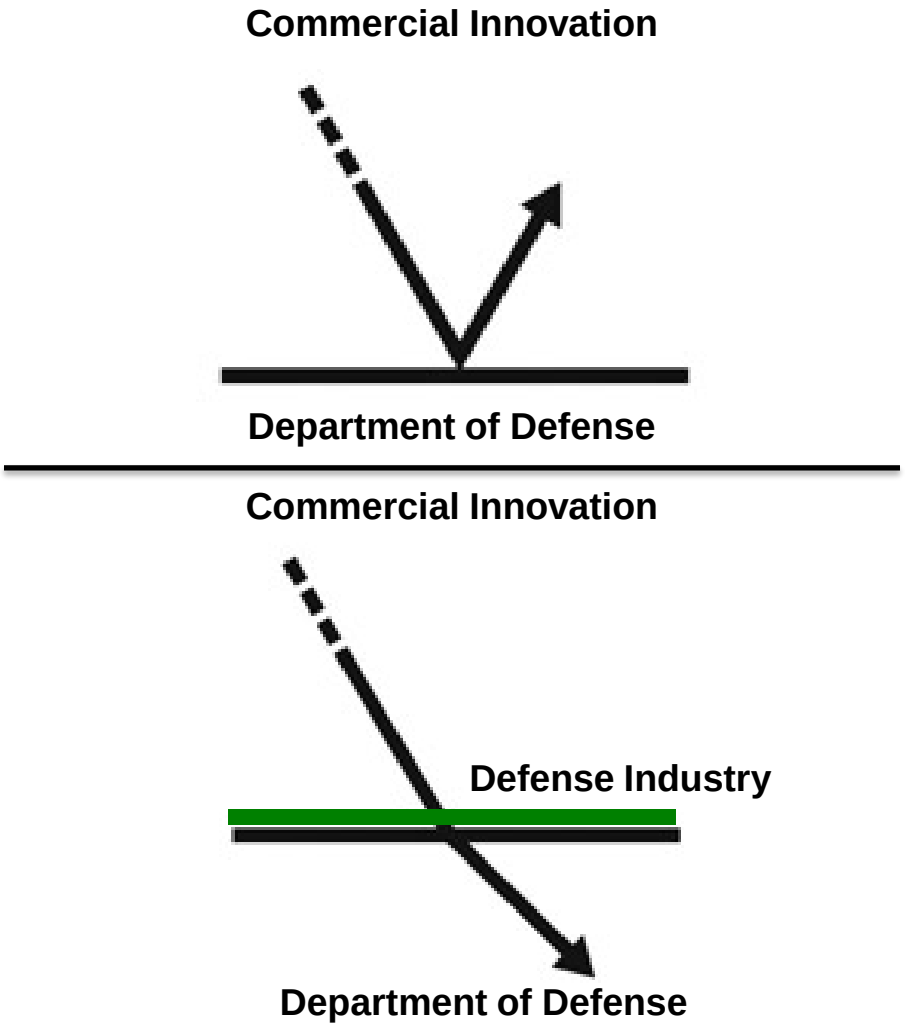
Technology Domain Awareness

Building a Defense Innovation Base

Defense innovation is not an either-or proposition (either traditional defense R&D or Silicon Valley-style innovation).

The vast majority of the global high tech sector is no longer focused on defense – and this is not a bad thing.

The defense industry will play a vital and enduring role translating commercial tech innovations to scalable, mission critical defense products.



National Security Technology Accelerator

Synchronizing Commercial Tech with Defense Needs

The **National Security Technology Accelerator** is the organizational arm of TDA. It provides information, services, and infrastructure to:

① Enhance technology decision-making
② Increase DOD access to technology
③ Identify emerging technology opportunities and threats
④ Execute rapid, cost-effective prototyping and experimentation
⑤ Support expanded DOD-industry collaboration and cost-sharing
⑥ Facilitate innovation education and training for the DOD community

The **NSTA** operates as a distributed DOD-university based research center facilitating the alignment of the global research and technology base with DOD applications and needs.

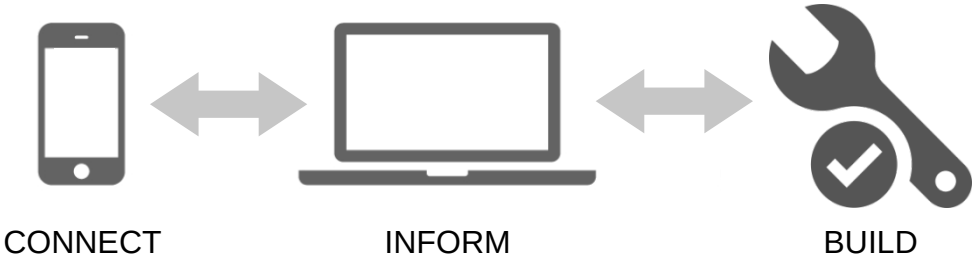
Project Vulcan

SOF-Focused Collaborative Innovation

Project Vulcan is the pilot deployment of a TDA-based innovation environment jointly funded by the DOD IACs and Special Operations Forces Acquisition, Technology, and Logistics (SOF AT&L).

It will demonstrate an advanced platform to connect problems, technologies, applications, and resources in support of innovative capability development.

Project Vulcan: linking technology resources to applications



Key Stakeholders

Technology Domain Awareness

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Project Vulcan

Deliverables (month 0-6)

Build a mobile-desktop technology discovery and knowledge management platform that supports the development of an extended SOF-focused, R&D community of practice.

① Platform design

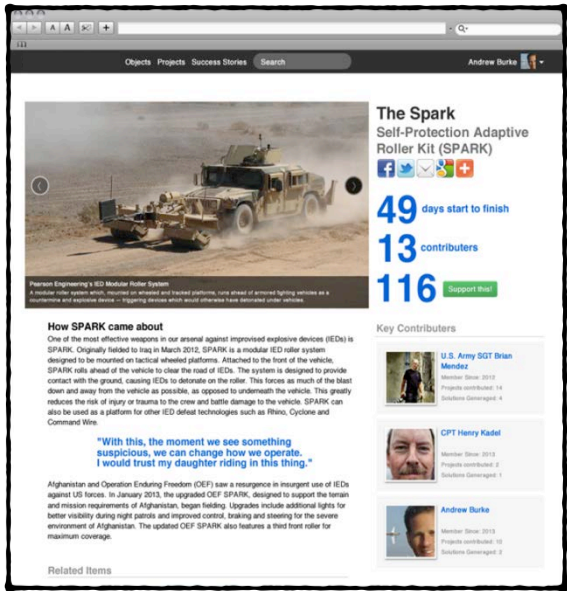
② Business Process: link information to decision points

③ Stakeholder incentives

④ University-based technology "finder" network

⑤ TDA-related metrics and measures of effectiveness

⑥ Technology discovery and knowledge management tool



Technology discovery and knowledge management tool

Technology Domain Awareness

Expected Outcomes

- Reduced Technology Surprise by more fully incorporating and monitoring the non-defense technology marketplace
- Improved Buying Power by leveraging non-defense co-investment and commercial economies of scale wherever possible to preserve DOD R&D spending for defense-specific technologies
- Increased Market Influence by organizing DOD investments to shape the commercial marketplace with the needs of defense in mind
- Reduced Technology and Operational Risk by focusing on applications of proven technologies and reducing the cost and time for capability delivery
- Enhanced Economic Security by deploying DOD R&D capital in a manner that supports the emergence of a robust Defense Innovation Base that creates shared value for DOD and the commercial marketplace

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Core Functions of TDA

Ensuring DOD's Technology Edge

TDA supports DOD's innovation objectives by aligning technology sources and uses with operations, planning, training and education, and acquisition.

Core Functions

① Connect distributed DOD innovation efforts and stakeholders

② Inform defense acquisition priorities and planning

① Build innovative prototypes through technology reuse

TDA links the resources needed to scale defense product innovation

Technology Domain Awareness

Current Status

- Pursuing deployment of a portfolio of Other Transaction Authority (OTA) vehicles for operationally responsive R&D
  - Awarded **OTA for Energy** to NSTXL Consortium
  - Planned OTA areas: Defense Systems, Homeland Defense, Cyber, and SOF-specific
- Implemented partnership agreement with National Defense University governing implementation of a National Security Technology Accelerator (NSTA) supporting execution of the TDA effort
- Negotiating agreements with multiple Combatant Commands governing a pilot deployment of a TDA-based technology prototyping and experimentation capability