# Speed Is Life:
## An Imperative for Speed and Adaptation

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# Overview

**Success in tomorrow's conflicts will depend on warfighters' ability to adapt everything from mission systems on aircraft to battle networks**

- U.S. military operations depend upon networks, and this reliance will only increase

- To operate while under attack, U.S. architectures and systems must adapt faster

**Mitchell Institute's report addresses three main barriers to accelerating the Air Force's ability to adapt its weapon systems and operational architectures:**

1. **Colors of money:** Funding categories are ill-fitted to software lifecycles and are paced by hardware paradigms

2. **Lack of dedicated system program office:** These technologies and software are typically managed and funded  - or not - as part of a larger weapon system program

3. **Centralized execution of operational architectures:**  It takes months to engineer the overarching and complex battle network structure from incompatible datalinks

> **DOD funding and processes obstruct the ability to develop, field, and operate software tools that can enable warfighters to adapt U.S. operational systems at mission need**

# The U.S. Way of War Depends Upon System-of-System Operational Architectures



- Employing U.S. capabilities as a system enhances operational effectiveness and efficiency
- U.S. datalink structures require significant systems engineering to represent and enable operational relationships

**The static nature of U.S. warfighting systems has allowed adversaries to develop strategies and technologies to target U.S. operational architectures to negate these advantages**

# Mission Integration Tools (MIT) Can Enable Adaptation at the Battlespace Edge

Mission integration tools allow planners and operators to build the operational and functional relationships they want among the platforms they have based on mission requirements, not hardware limitations

System of Systems (SoS) Integration Technology and Experimentation (SoSITE)
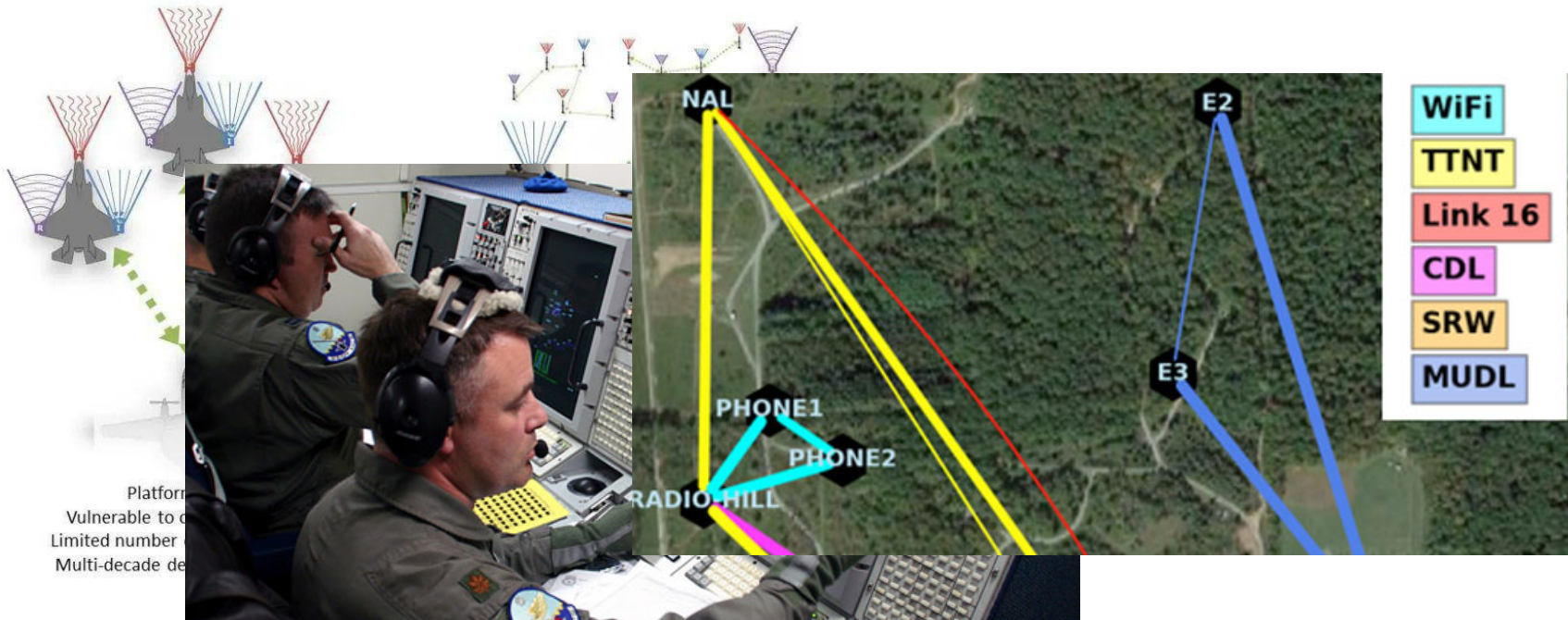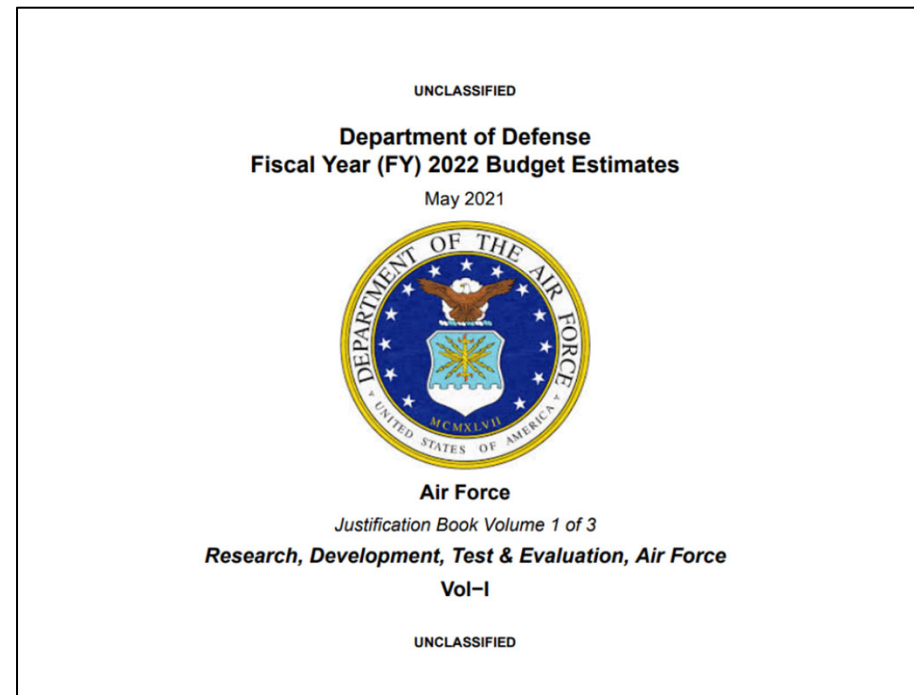


**Mission Integration Tools can enable future operational concepts with today's force**

# Funding Categories Ill-Fitted for Mission Integration Software Tools

**DOD funding categories continue to treat the development, fielding, and operations of software tools as hardware**

- **JCIDS process too slow for MIT**
  - Takes years to progress through requirements definition, AoA, etc.
- **Software Budget Activity BA-8 still requires JCIDS process**
  - Cannot be applied to broad area announcements
- **Research agencies cannot use BA-8**
- **The evolving nature of MIT result in being defined as RDT&E**
  - 3600 funding prevents fielding in operational command

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**Department of Defense
Fiscal Year (FY) 2022 Budget Estimates**

May 2021

**Air Force**

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**Funding mechanisms slow down the speed at which software can be developed , and  they obstruct the fielding of adaptive software**

# Management of Mission Integration Risks Being Subject to a Sponsor Program

- **Mission Integration today is System Integration**
  - Dependent on the weapon system
  - Developed in a stovepipe, may limit interoperability
- **Funding for adaptation is dependent on modernization priorities**
  - Must compete against more traditional sensor and kinetic upgrades
  - Often falls below the cut line
- **Examples:**
  - Link-16
  - IFDL / MADL





> **U.S. operational architectures are fairly rigid because they are subject to the weapon systems hardware and programming**

# Operational Architectures are Too Centrally Managed to Be Responsive to the Battlespace

**The more complex and integrated combat operations becomes, the more unwieldy the networks**



JTIDS

- **Networks must mirror how U.S. and coalition forces will operate**
  - o Developing an architecture takes trained specialists
  - o Networks architectures can take months to plan and are not easily changed
- **Proliferation of different types of datalinks and operational relationships complicate this architecture**
- **Limitations inherent to weapon systems further strain the system**
  - o These are known to adversaries

**Warfighters are dependent on modernization timelines and centralized processes to adapt to the battlespace**

# RISK: The static nature of U.S. operational architectures enables adversary attack

Adversaries, and particularly China, have been studying U.S. operational architectures and datalinks for decades. This enables them to pursue a strategy of system destruction through:
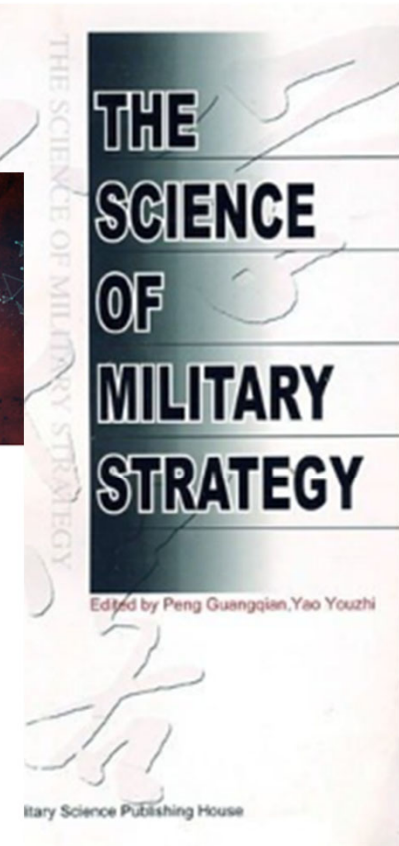
- Degrading the flow of information

- Targeting key nodes of U.S. operational systems

- Degrading U.S. operational architectures

- Distorting and Extending our operational tempo



Systems Confrontation and System Destruction Warfare

How the Chinese People's Liberation Army Seeks to Wage Modern Warfare

Jeffrey Engstrom



THE SCIENCE OF MILITARY STRATEGY

Edited by Peng Guangqian, Yao Youzhi

Military Science Publishing House

**Targeting and collapsing U.S. and coalition operational architectures is key to how China and other adversaries will defeat us**

# Recommendations (1)

**1. Congress and the Air Force should resolve the disconnect that prevents research agencies like AFRL and DARPA from appropriately using BA 8 to fund software program efforts initiated under broad area announcements:**

- Broad area announcements are crucial to creative problem solving

- Applying the ability to fund the entire software lifecycle – from development through fielding – is crucial to speed and innovation

- Must provide the option to avoid re-competing the program during transition

- Must provide a seamless transition from research agency to operational command

- Operational commands should also have a similar software budget activity that enables them to employ, sustain, and evolve appropriate software programs

> **Software funding mechanisms must accommodate the speed of software, BAAs, and seamless fielding to the warfighter**

# Recommendations (2)

**2. The Air Force should consolidate the development, acquisition, management, and modernization of mission integration tools as individual programs of record within a dedicated program office:**

- Mission integration software tools must be funded as independent, stand-alone programs – not as part of another weapon system modernization plan

- These MIT should reside together in a dedicated SPO to provide portfolio-wide understanding of capabilities and gaps

- Will provide for stronger management and advocacy

**Developing, funding, and managing mission integration software tools as independent programs under a dedicated SPO will enable agile operations**

# Recommendations (3)

**3. The Air Force should train and resource JICOs as mission integration officers and embed them at all operational levels—especially at the unit level:**

- Joint integration officers are natural fits to meet this need

- These officers should reside at the unit level and be funded through normal O&M accounts

- Manning at the unit level will enable these officers to adapt operations at mission need



**Mission integration officers at the unit level would accelerate the adaption cycle of combat operations**

# Recommendations (4)

**4. The Air Force should experiment with and develop mission integration tactics, techniques, and procedures for training, employment, and risk management:**

- Adapting operational architectures carries some disruptive risk to established structures

- Developing TTPs can provide risk management through standardization of MIT employment

- Just as traditional weapon systems continuously evolve to exploit the potential of new capabilities, TTPs for mission integration tools can enhance employment and future development

The USAF Warfare Center is an ideal organization to experiment with mission integration tools and develop TTPs for their employment

**Experimenting with and developing TTPs for mission integration tools will enhance mission outcomes while managing risk**

Mission integration tools and the officers who will employ them will have an outsized impact on revolutionizing combat operations. To achieve this kind of rapid adaptation, the Air Force should:

1. Manage the lifecycle of mission integration tools as individual programs of record within a dedicated program office

2. Resolve the funding category disconnect to empower research agencies and operational commands to develop and field mission integration tools

3. Train and resource mission integration officers, and embed them at all operational levels

4. Experiment with and develop mission integration TTPs

The Air Force must adapt its management, funding, and manning mechanisms to enable resilient and effective operational architectures

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