Capability Composition and Data Interoperability for Effective Results

Nickolas H. Guertin, PE

Douglas C. Schmidt, PhD

William Scherlis, PhD

Software Engineering Institute
Carnegie Mellon University
Pittsburgh, PA 15213

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Speed of Capability

The U.S. DoD is the envy of all nations, but …

- Near-peer competitors are progressing faster than we change
  - e.g., COTS tools & building blocks are available to all
- New threats are vexing in key warfare areas

- To move faster, we need a different approach
- The environment is ripe with opportunities for new approaches

Harness the innovation engine of the nation & the world

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Setting the Stage for a New Approach – What's Different About Going Modular & Delivering Rapidly?

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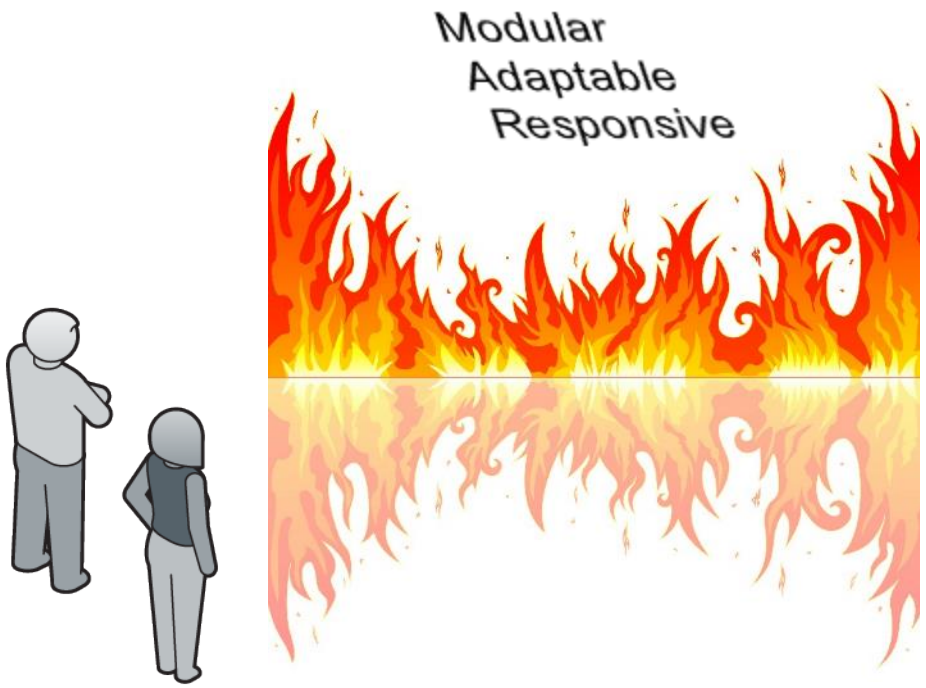
Nimble Responses to Nimble Adversaries via Modularity & Rapid Delivery

Everything on the table to change the DoD acquisition ecosystem:

- Continuous change in the field
- Financial management
- Innovation Engine
- Organization
- Contracts
- Incentives
- Training
- Certification
- Operations



Establish the environments to support exquisite capability

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Move to Modularity & All That It Means

Cyber-physical products are never done

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Move to Modularity & All That It Means

Cyber-physical products are never done

Continuous engineering & development/operations pairing

- No software part of a product ever gets to “sustainment”
- Everything is being improved throughout the lifecycle
- The new “requirement” is stable – be operationally relevant
- Capability is delivered in modules, as soon as they are ready

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Setting the Stage: An Architecture-Centric Approach

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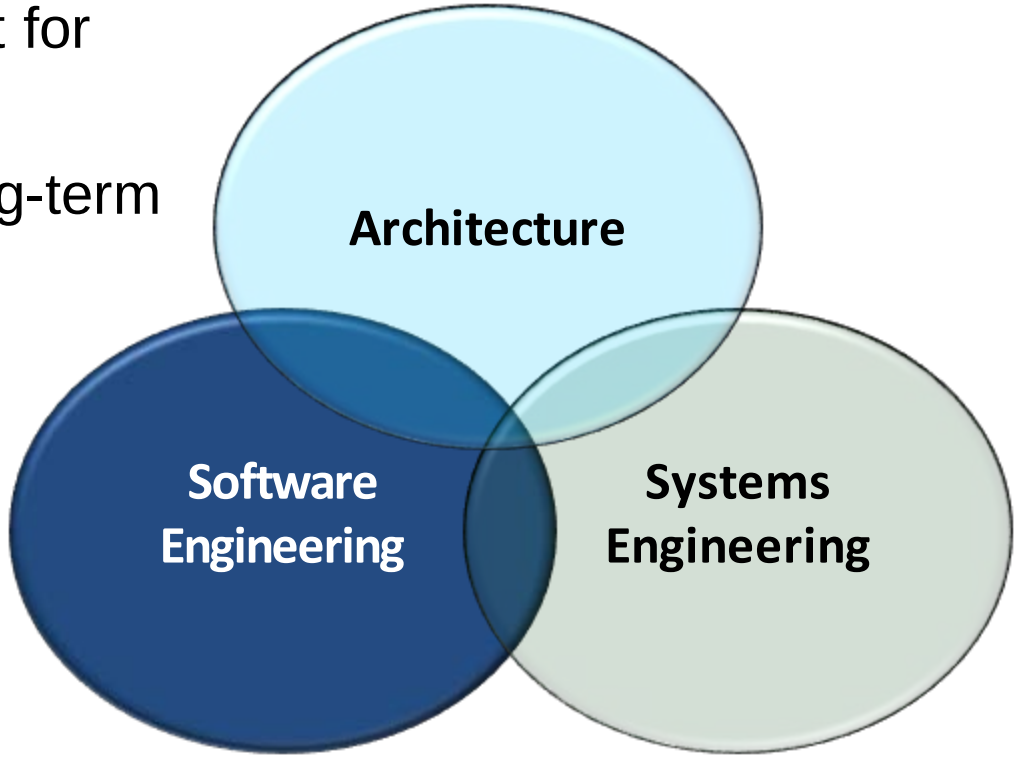
Architecture-Centric Approach

- Address military requirement for flexibility
- Optimize trade space for long-term responsiveness & performance
- Address continuous modular improvement in design
- Identify areas for innovation growth
- Tie development to operations and warfighter responsiveness



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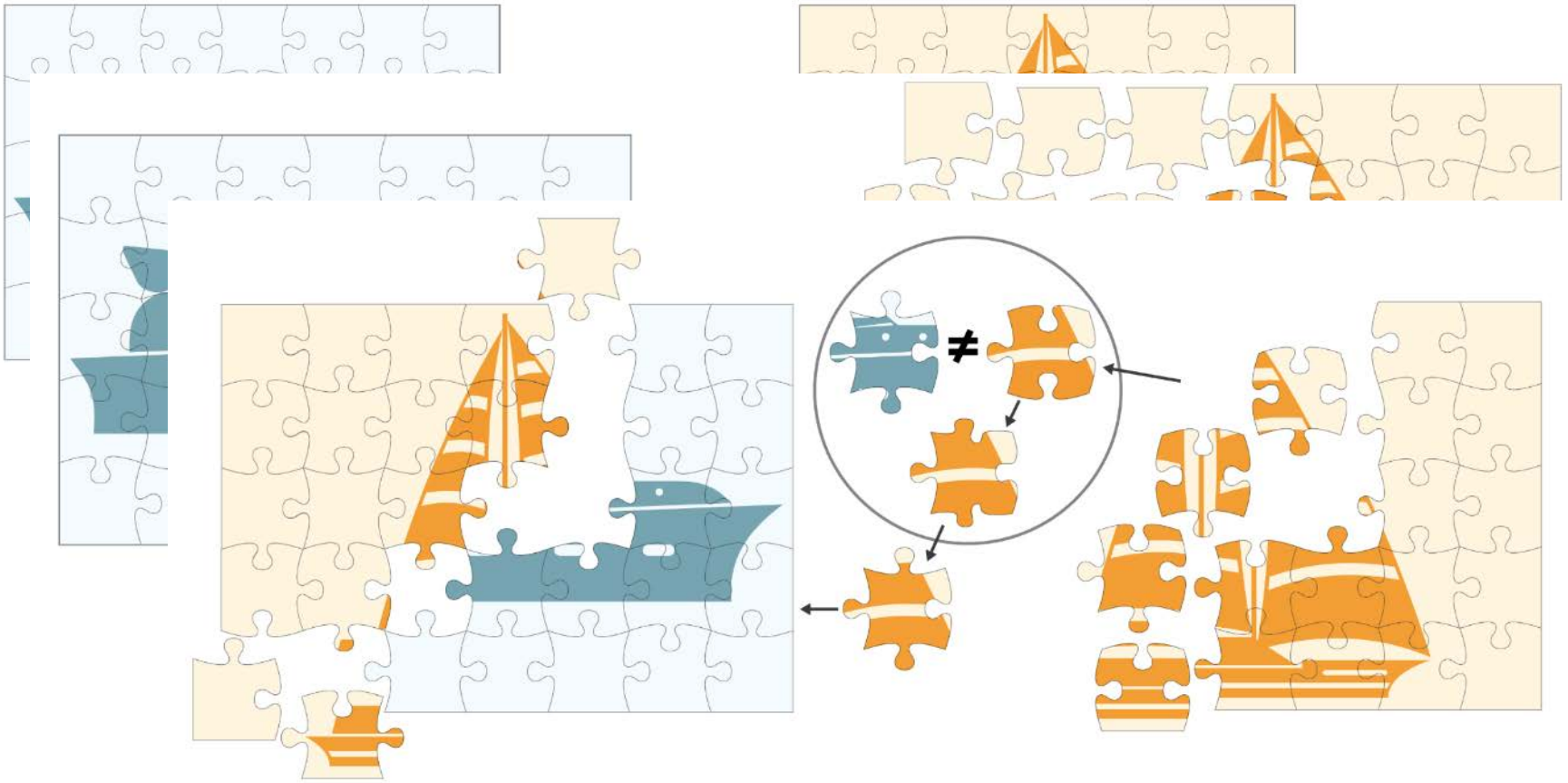
Purpose-Built / Tight Coupling Results in Limited Use



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Foundational Architectures Designed to Support Loose Coupling & High Cohesion

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The Power of Technical Frameworks: Avionics

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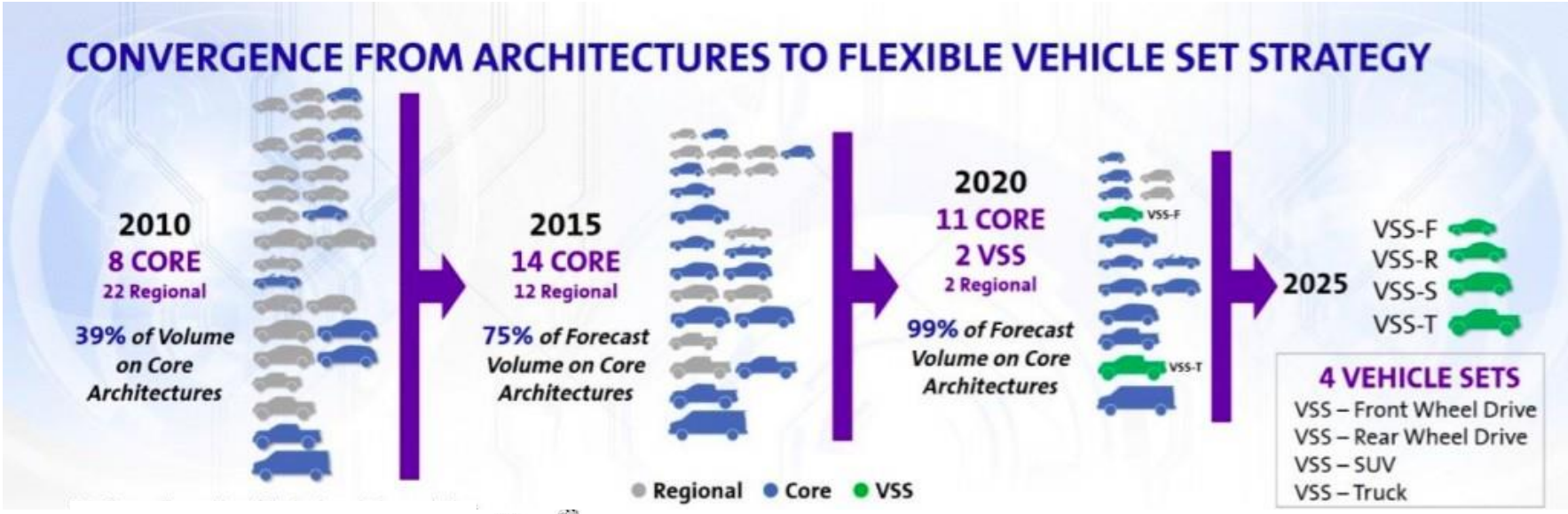
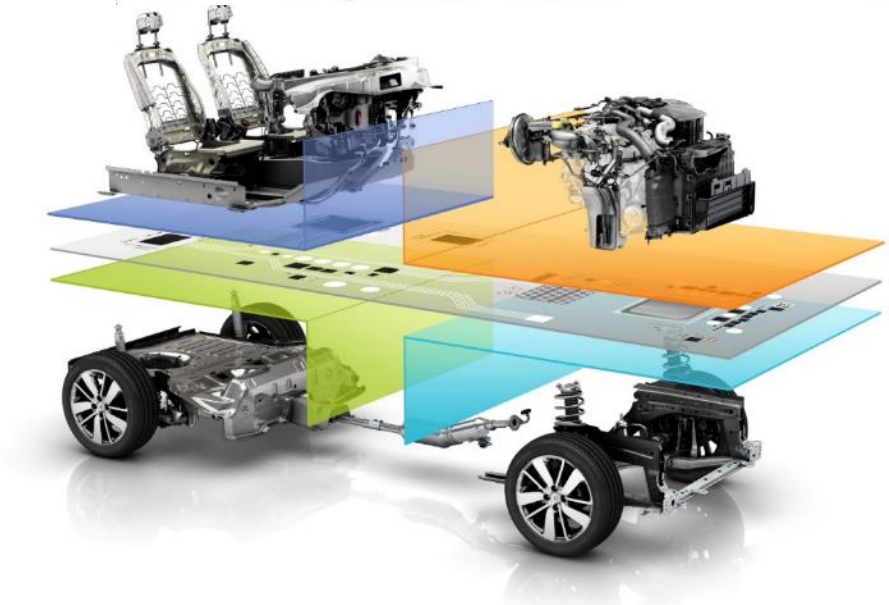
The Power of Technical Frameworks: Automotive





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Organizational Impacts to Going All-in to Achieve Flexibility & Speed of Delivered Capability

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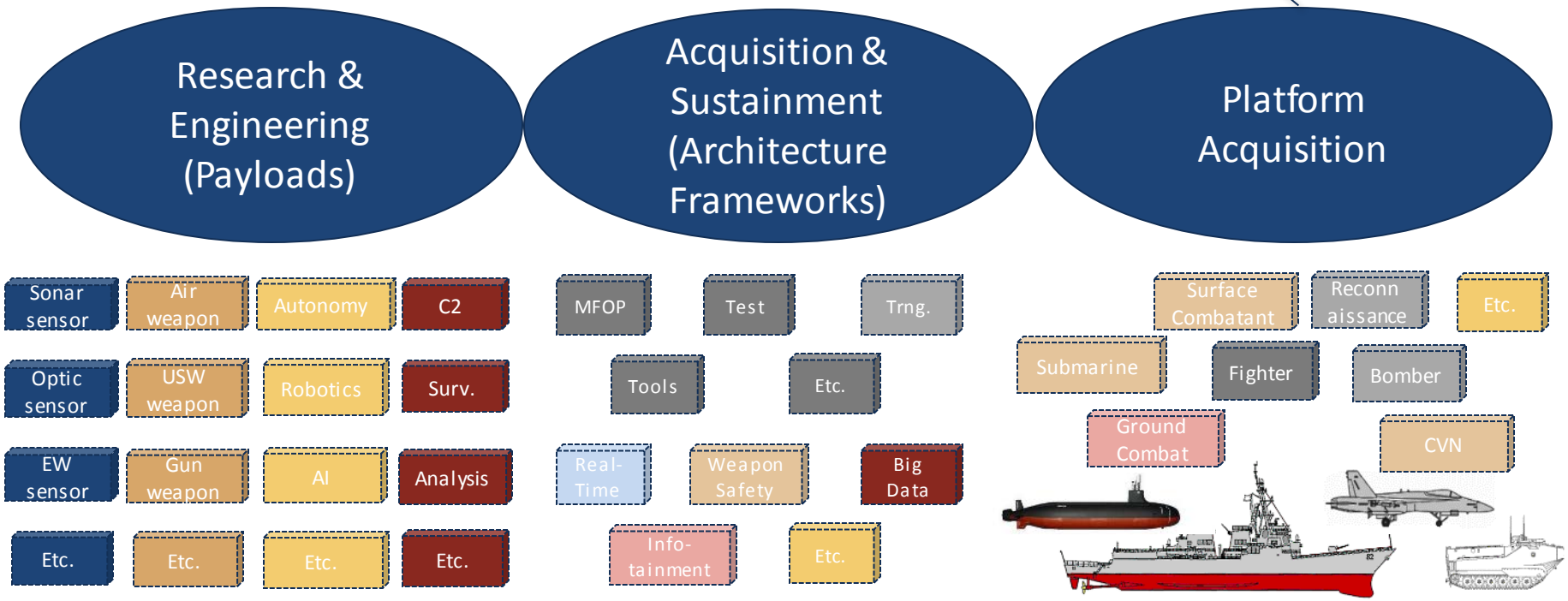
Proposed Organizational Construct

Natural alignment & separation of concerns

Platform acquisition is the receptacle for payloads of composed module (does not develop payloads)



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Proposed Organizational Construct

Natural alignment & separation of concerns

R&E creates payloads out of modules to create effects (responsive to platform to create military effect)

Research & Engineering (Payloads)

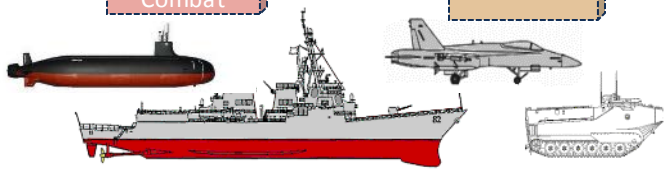
- Sonar sensor
- Air weapon
- Autonomy
- C2
- Optic sensor
- USW weapon
- Robotics
- Surv.
- EW sensor
- Gun weapon
- AI
- Analysis
- Etc.
- Etc.
- Etc.
- Etc.

Acquisition & Sustainment (Architecture Frameworks)

- MFOP
- Test
- Trng.
- Tools
- Etc.
- Real-Time
- Weapon Safety
- Big Data
- Info-tainment
- Etc.

Platform Acquisition

- Surface Combatant
- Reconn aissance
- Etc.
- Submarine
- Fighter
- Bomber
- Ground Combat
- CVN



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Proposed Organizational Construct

Natural alignment & separation of concerns

A&S establishes the foundational environment to deploy modules (responsive to the needs of R&E in a way that fits the platform)

Research & Engineering (Payloads)

- Sonar sensor
- Air weapon
- Autonomy
- C2
- Optic sensor
- USW weapon
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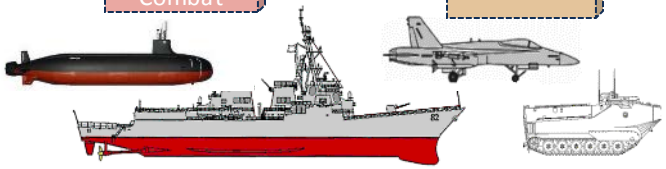

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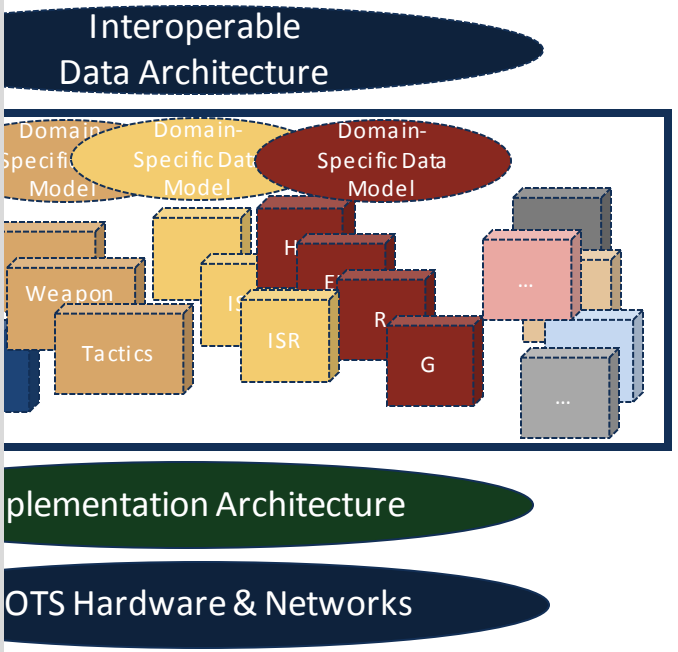
Separation of Concerns: A&S & R&E

- Payloads composed of



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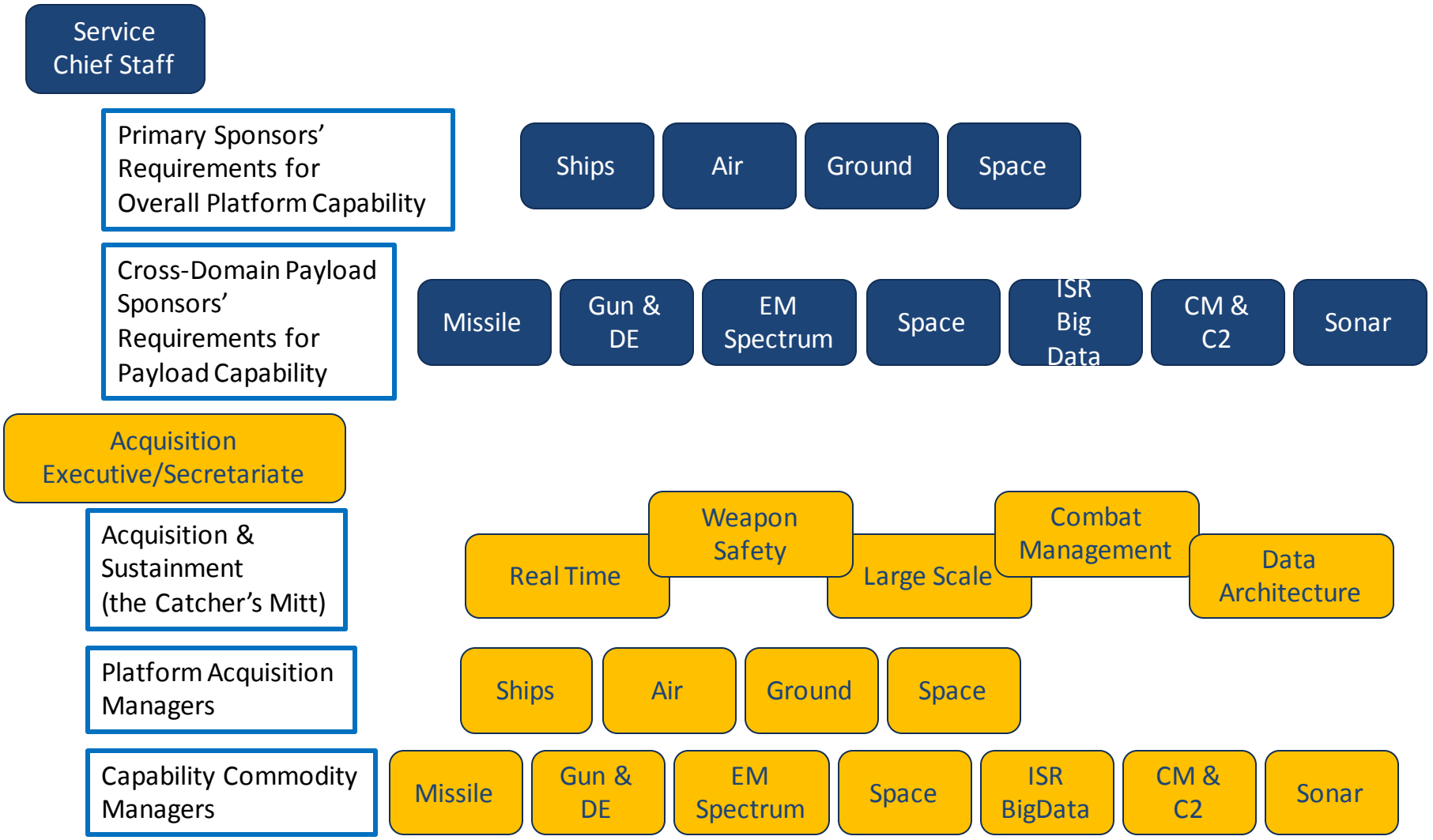
Addressing Goldwater–Nichols



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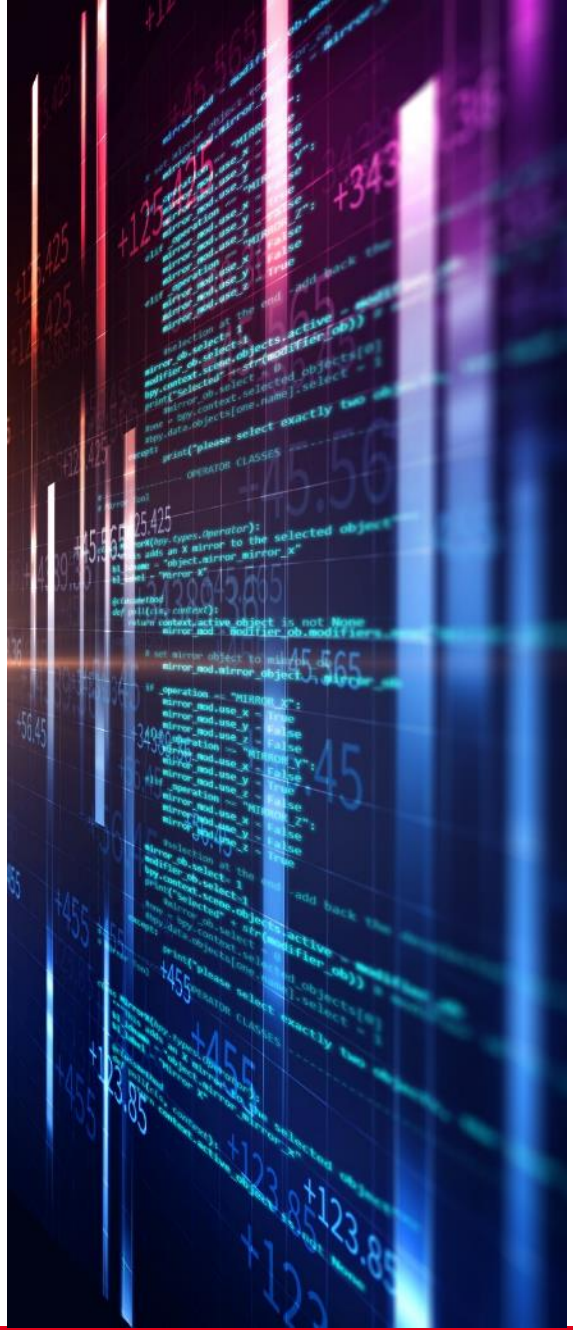
Business & Contracting Impacts to Going All-in on Modularity & Rapid Improvements



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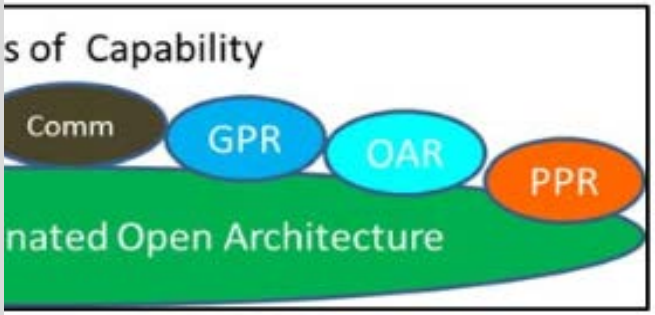
Open Acquisition Strategy

Government is the “business integrator”



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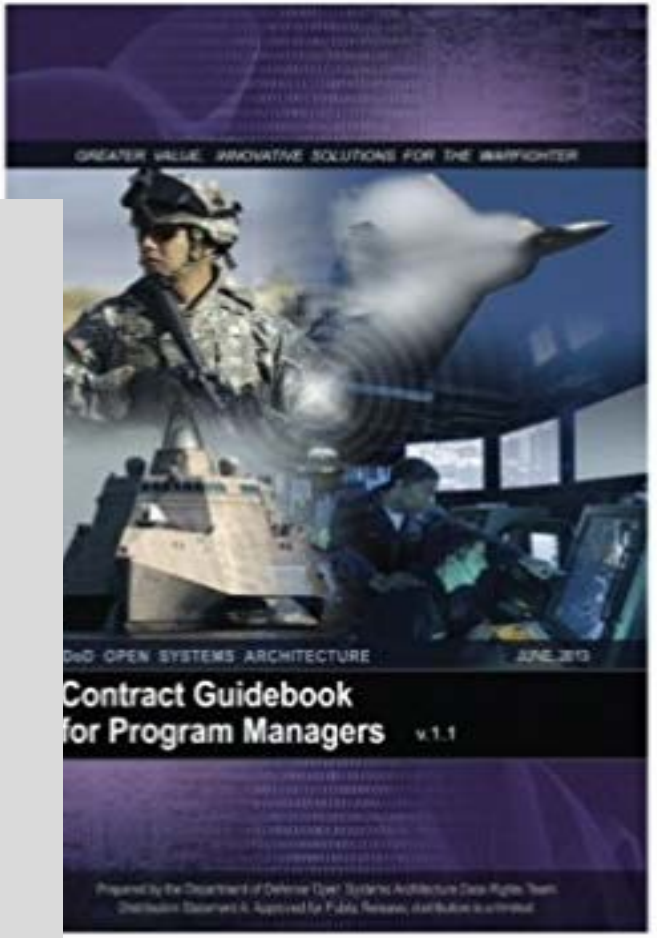

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Open Acquisition Strategy

Government is the “business integrator”

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Business Strategy that Matches the Technical Strategy

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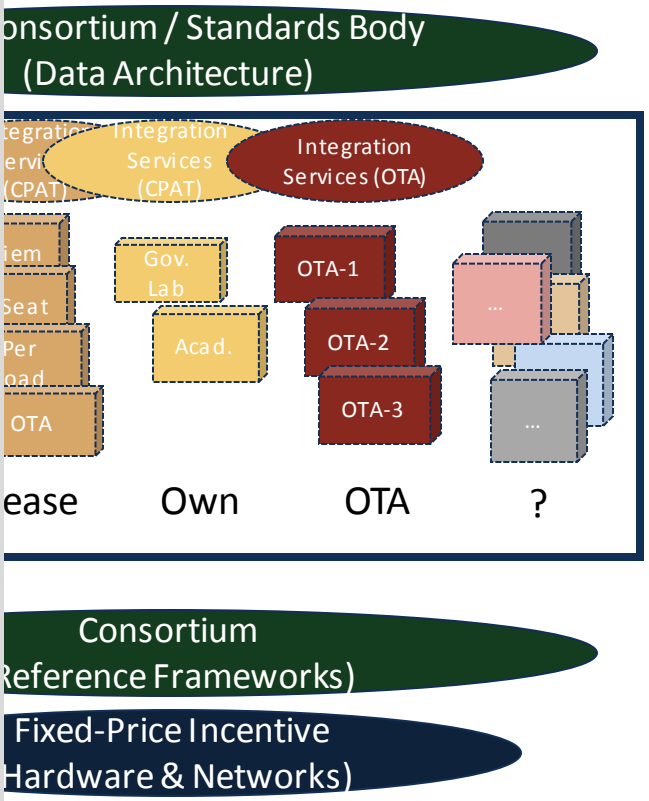

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Summary of Recommendations

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Actions

- Establish new budgetary

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Outcomes

- Elimination of big overruns &

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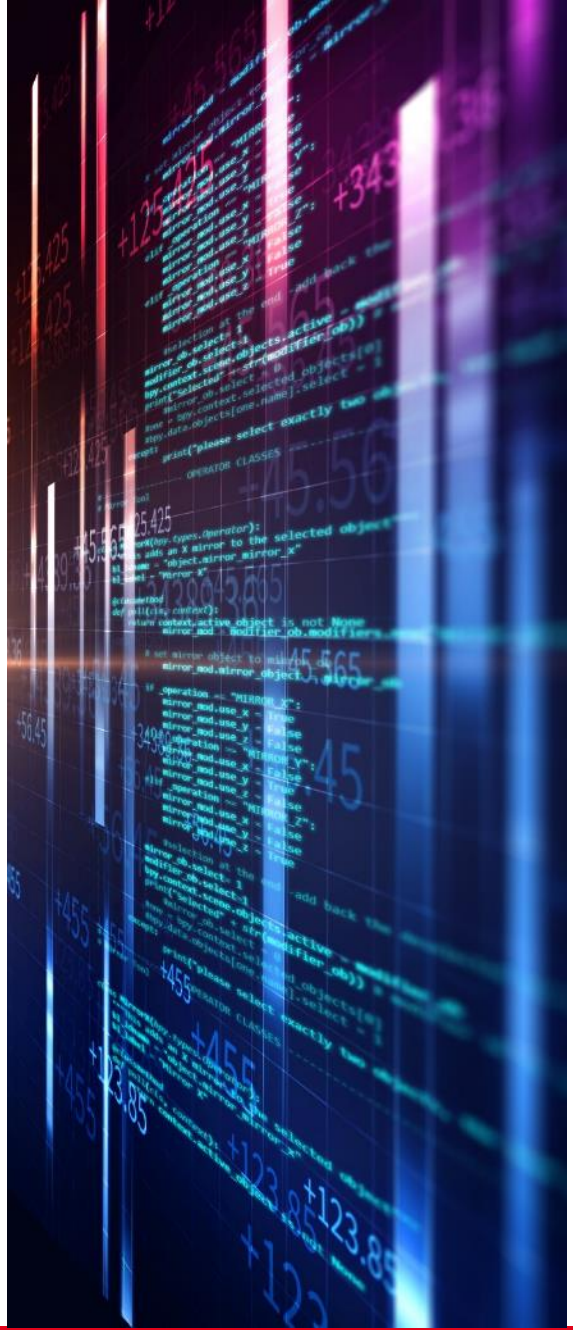
Questions



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