Open System Acquisition (OSA)*

Chris Gunderson
cgunders@nps.edu
831 224 5182

*USAF Bending the Cost Curve Plug Fest Plus initiative is piloting OSA

Defense Acquisition Process Scope

- Pre Systems Acquisition
  - Solution Analysis
  - Technology Development
- Systems Acquisition
  - Engineering and Manufacturing Development
  - Production and Deployment
- Sustainment
  - Operations and Support
- Disposal

Acquisition Process Activities

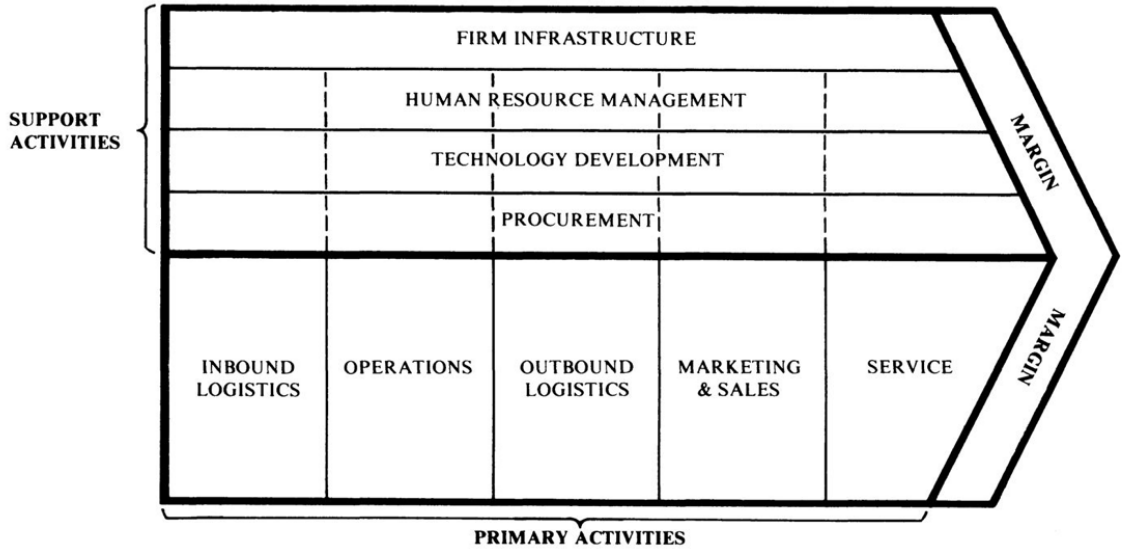
- Project Management
  - Work breakdown
  - Scheduling
  - Risk management
  - Documentation
- Engineering
  - Requirements analysis and assessment
  - Risk analysis
  - Validation and Verification (including Test & Evaluation)
  - Fabrication
- Procurement
  - Solicitation
  - Award
  - Contract performance oversight

Acquisition Process Interfaces with Symbiotic Processes

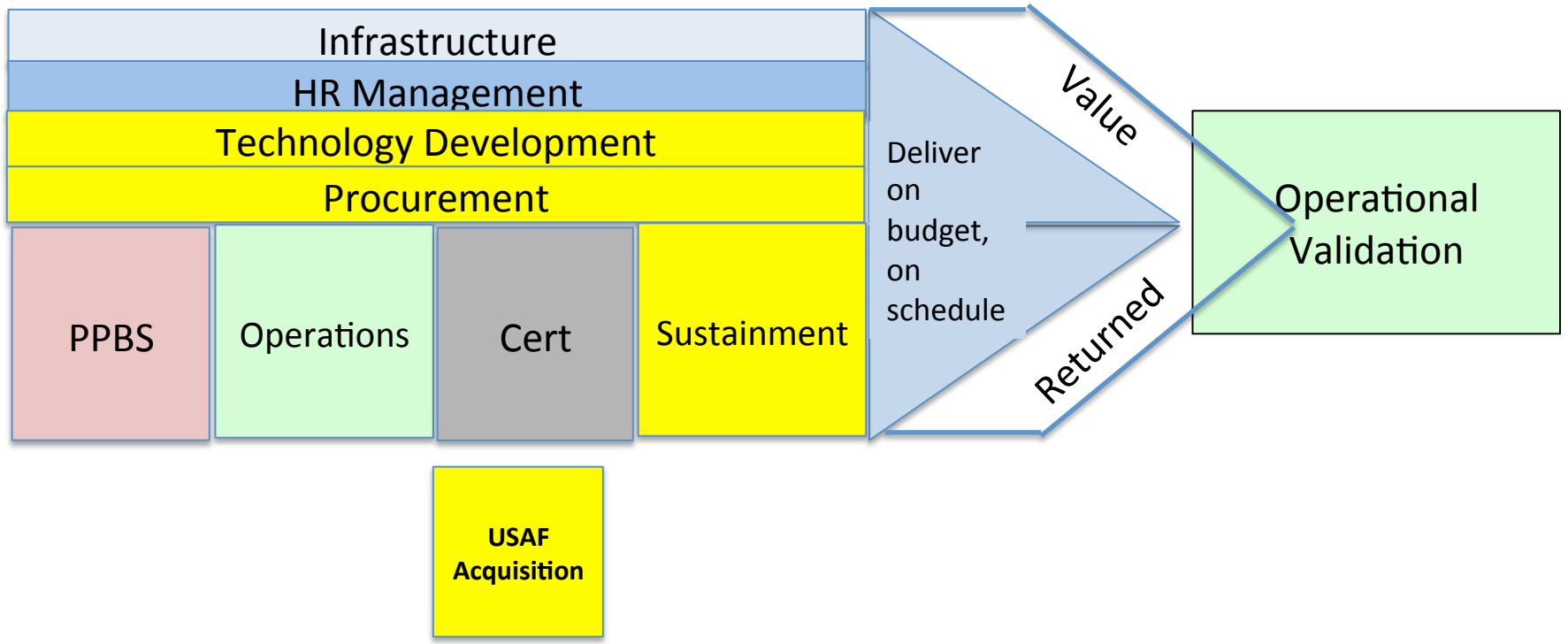
- Requirements
  - Acq Process accepts requirements from, e.g. JCIDS, ACTDs, special projects, lifecycle tech refresh process.
    - Analyzes and decomposes requirements
    - Converts requirements into engineering quality artifacts
    - Validates and Verifies (V&V) requirements
- Cyber Security
  - Acq Process prepares RMF artifacts for Certification and Accreditation(C&A) by Accreditation Officials (AO)
- Training and Education
  - Acq Process documents lessons learned and best practices and shares with Academic and Training communities

Open System Acquisition (OSA) Defined

Effective practices, processes and activities for interpreting requirements, engineering solutions, and procuring, deploying, and disposing of materiel associated with rapidly evolving information systems that are composed of highly factored, independently maintained, and highly reusable, modular components.

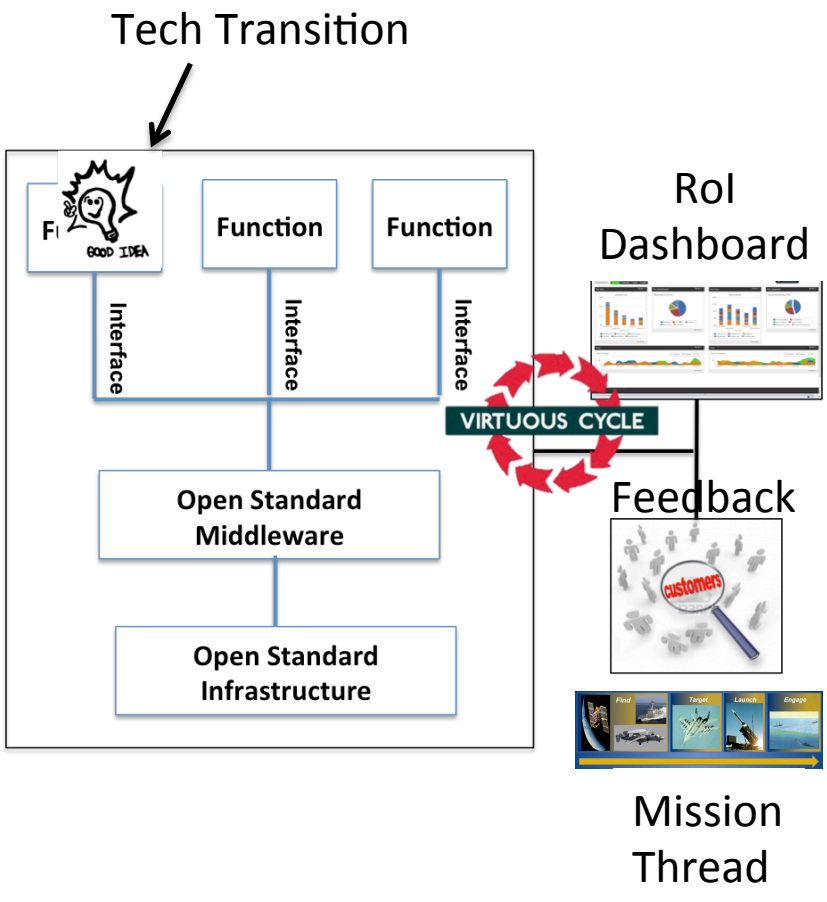


Objective is to Optimize the Value Chain



OSA Business Model based on Product Line Architecture (PLA)

- Targeted business/operational objectives drive technical design
  - Capability providers don't compete over infrastructure.
  - Single point of access for targeted consumer community
  - Maintain continuous feedback loop between provider and consumer communities
- Same basic technology "fits" into varying form factors (e.g. cloud server, work station client, mobile device..)
- Platform for tech transition (Apps Store metaphor)
  - Incentivize max innovation in functional "boxes"
  - Ruthlessly demand compliance with open interfaces
  - Front-end load IP model, security services, V&V platform, compensation model, and on-boarding process



OSA Perspective re Acquisition Process Scope

- Pre Systems Acquisition
  - **Solution Analysis**

Align operational and business requirements with technology standards via Product Line Architecture (PLA). Identify COTS/GOTS that can satisfy greatest % requirements immediately

  - Technology Development

Invest RDT&E funds for GOTS/COTS providers to make incremental improvements to existing products/services

- Systems Acquisition
  - Engineering and Manufacturing Development

Invest RDT&E to integrate COTS/GOTS per PLA

  - Production and Deployment

Invest O&M funds to purchase enterprise COTS/GOTS license rights

- Sustainment
  - Operations and Support

Leverage license rights to have COTS/GOTS providers continually refresh technology

- Disposal

Plan and budget to replace COTS/GOTS architecture every 3 years (2 X Moore's Law cycle)

OSA Activities

- Project Management
  - Work breakdown

Apply portfolio management. Breakdown aligns with COTS/GOTS provider independent activity and integration activity.

  - Scheduling

Schedule COTS/GOTS providers to work independently in parallel over short developmental increments. Schedule integration events including plugtesting for interoperability and security after each developmental increment. Plan to harvest and deploy mature capability bundles after these events.

  - Risk management

Make "interoperability" and "speed-to-capability" primary risks. Require vendor prior performance in both categories. Include balance of high and low risk components in WBS portfolio. Plan upfront for some components to "fail."

  - Documentation

Modify traditional acquisition artifacts to accommodate all the above

OSA Activities

- Engineering
  - Requirements analysis and assessment

Analyze mission threads and identify objective Measures of Effectiveness (MOE) Select objective Measures of Performance (MOP) that are testably correlated to MOE

  - Risk analysis

Apply objective plugtest results to assess progress against MOP/MOE.

  - Validation and Verification (including Test & Evaluation)

Invest heavily in plugtesting. Achieving threshold MOP = verification. Achieving threshold MOE = validation.

  - Fabrication

Invest RDT&E $ to have COTS/GOTS providers develop feature sets, e.g. open interfaces/cyber security, consistent with government requirements

OSA Activities

- Procurement
  - Solicitation

Contract for delivery of components rather than systems. Specify and ruthlessly enforce/incentivize open interface compliance.

  - Award

Use objective plugtest against MOE/MOP as source selection criteria.

  - Contract performance oversight

Use objective plugtest against MOE/MOP during integration events as basis for evaluating contract performance

OSA Process Interfaces with Symbiotic Processes

- Requirements
  - Acq Process accepts requirements from, e.g. JCIDS, ACTDs, special projects, lifecycle tech refresh.
    - Analyzes and decomposes requirements

Factor requirements against technological functional categories

    - Converts requirements into engineering quality artifacts

Develop PLA to align operational and business objectives with functional applications connected via open standard interfaces.

    - Validates and verifies (V&V) requirements

Establish continuous feedback with operational "beta" community to establish and refine MOE and MOP for V&V via plugtesting

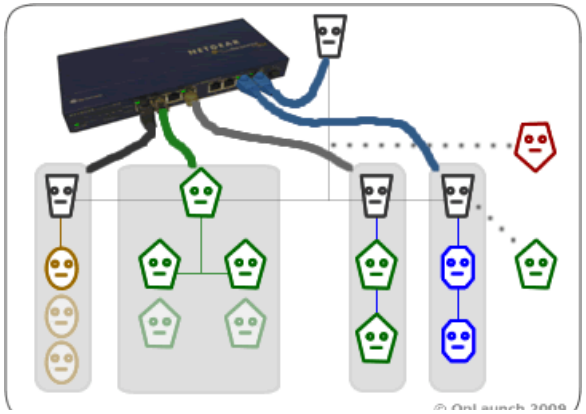
- Cyber Security
  - Acq Process prepares RMF artifacts for Certification and Accreditation(C&A) by Accreditation Officials (AO)

Establish rapport with relevant AO(s) at project onset, maintain throughout project lifecycle. Negotiate intentions to use logical separation inherited from assured virtual "security layer" as basis of RMF.

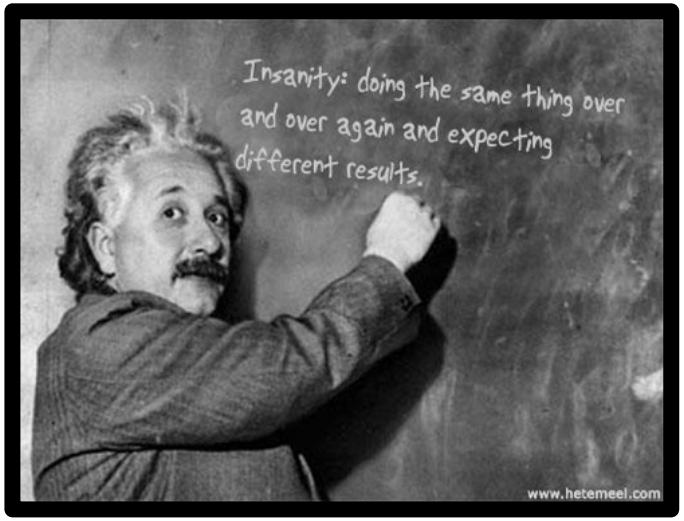
- Training and Education
  - Acq Process documents lessons learned and best practices and shares with Academic and Training communities

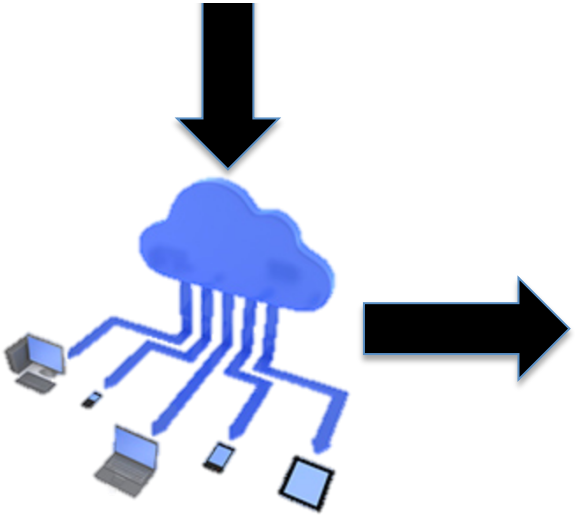
Capture lessons learned and best practices within templates suitable for inclusion in standard acquisition artifacts. Establish regular feedback loop with training and education community to prepare and/or update their materials.

Transforming to Open System Requires OSA

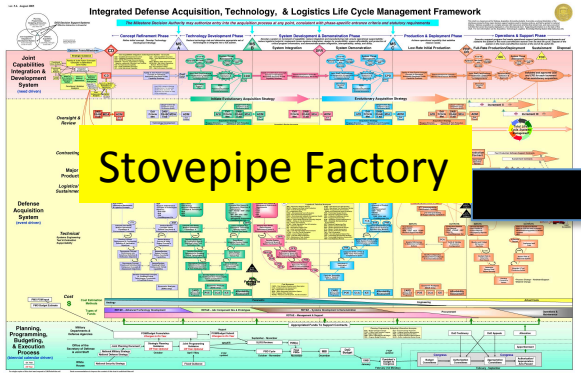


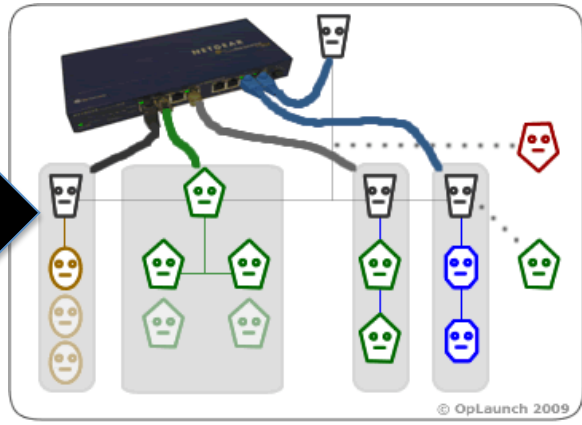
Networked Stovepipe System





Open System Requirement





Networked Stovepipe System

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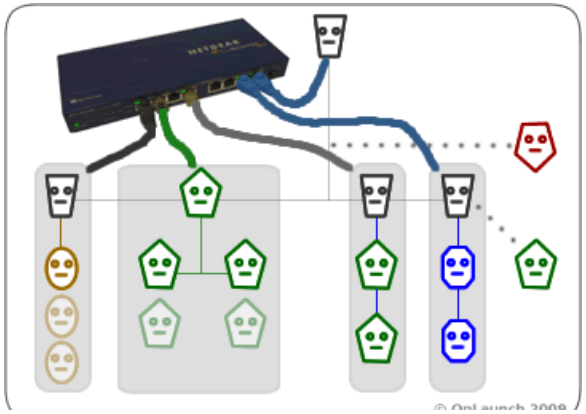
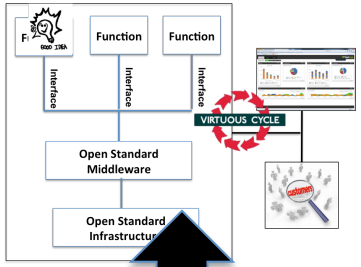


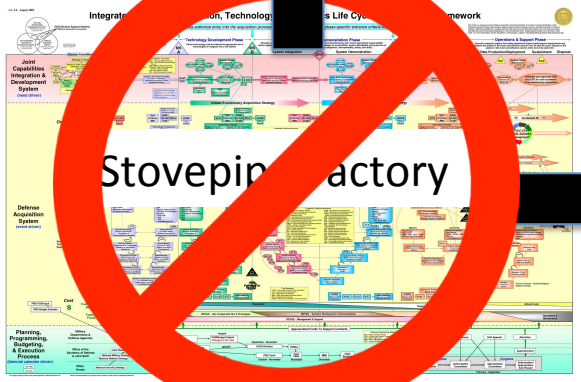
Networked Stovepipe System

Open System Approach



Open System

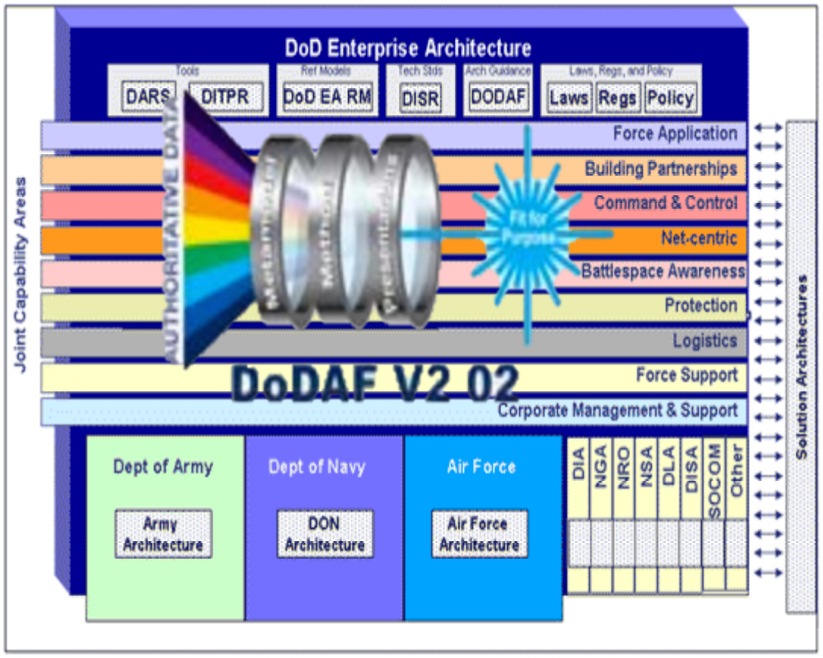
Open System Requirement



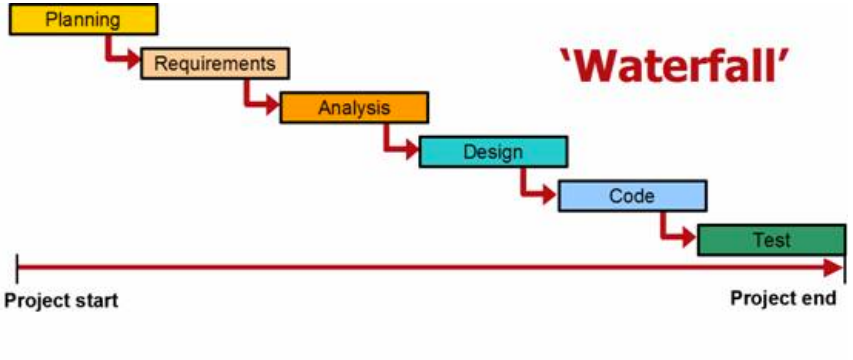
Stovepipe Factory

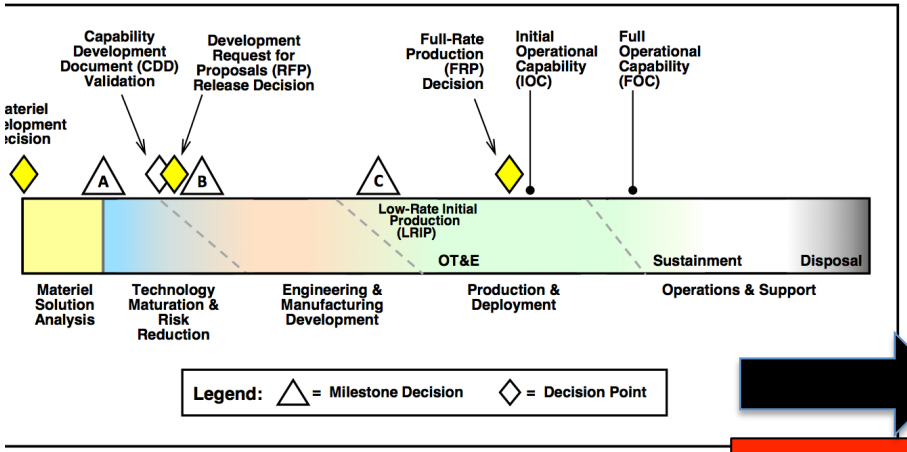
Networked Stovepipe System

Traditional Acquisition



Components of the DoD EA

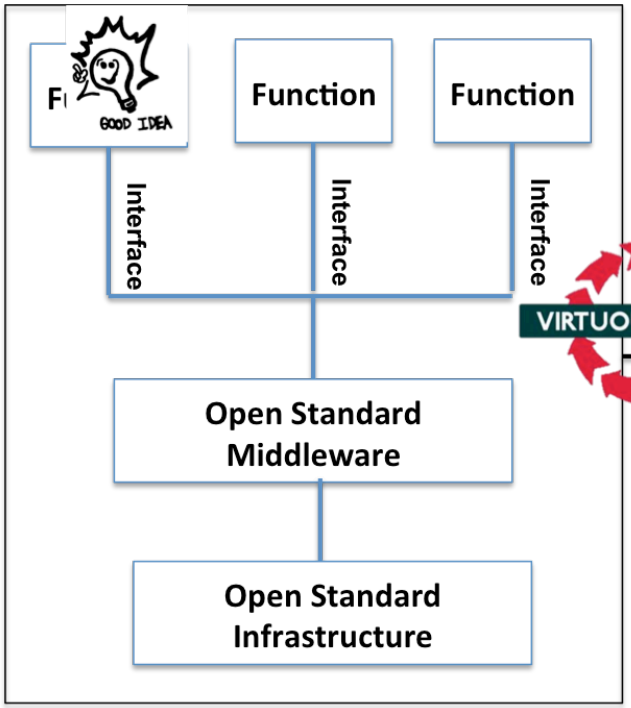




Serial C&A based on physical separation

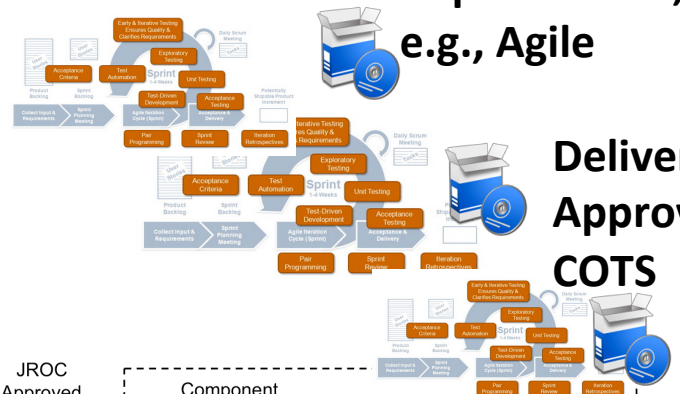
Open System Acquisition

Product Line Architecture Aligns Requirements with Open Components



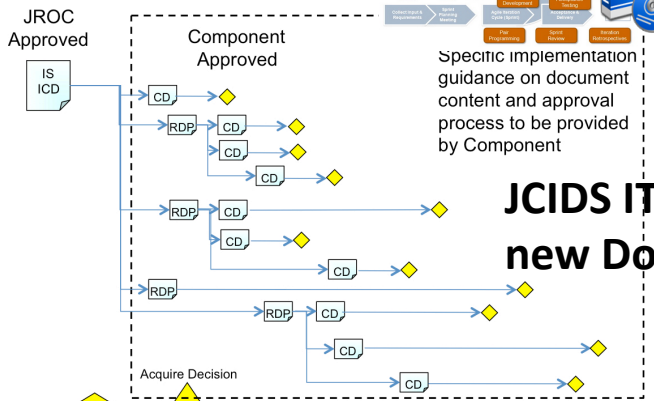
Reuse COTS/GOTS

Contract via OTA for Rapid Evolutionary Improvement, via e.g., Agile

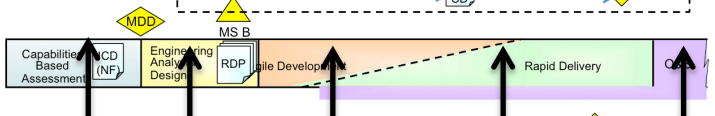


Deliver Approved COTS

VIRTUOUS CYCLE



JCIDS IT Box + new DoDI 5000

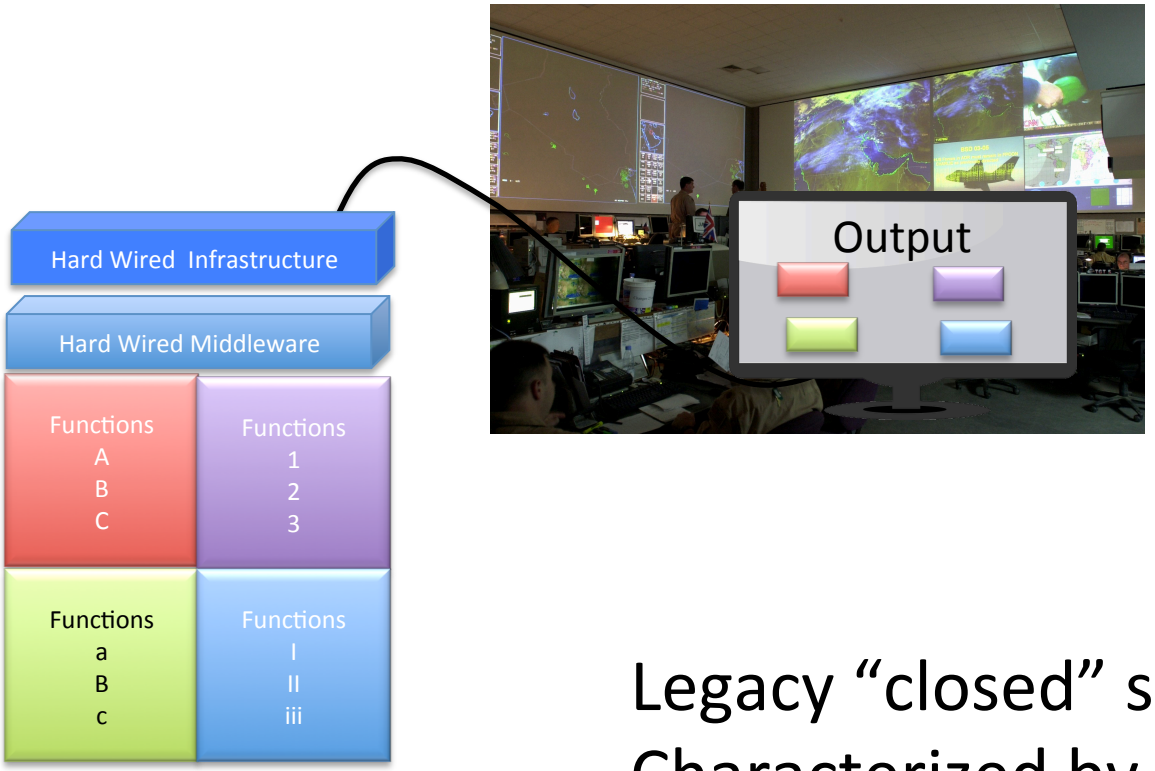


New RMF guidance

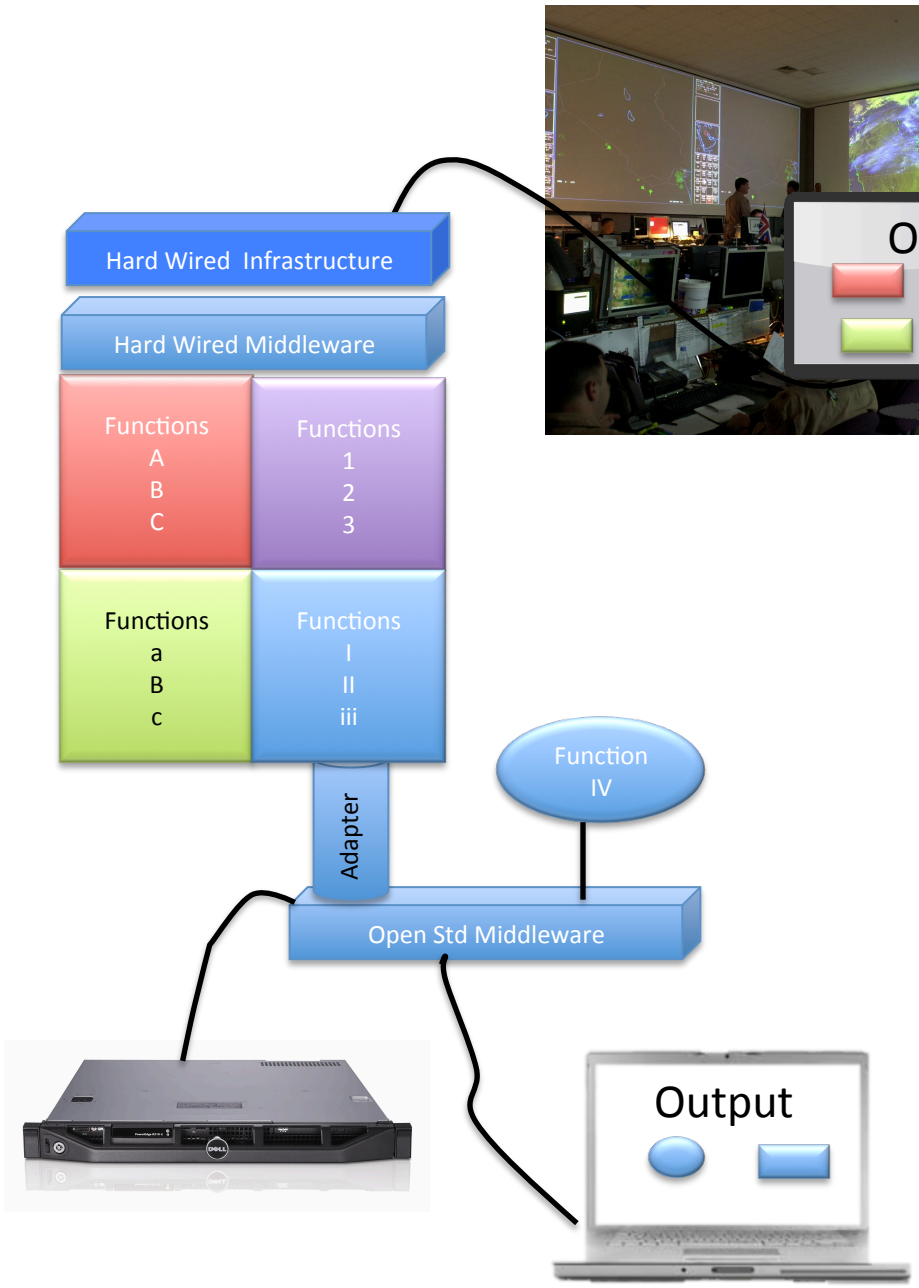
Parallel C&A based on virtual separation

Closed to Open System Transformation

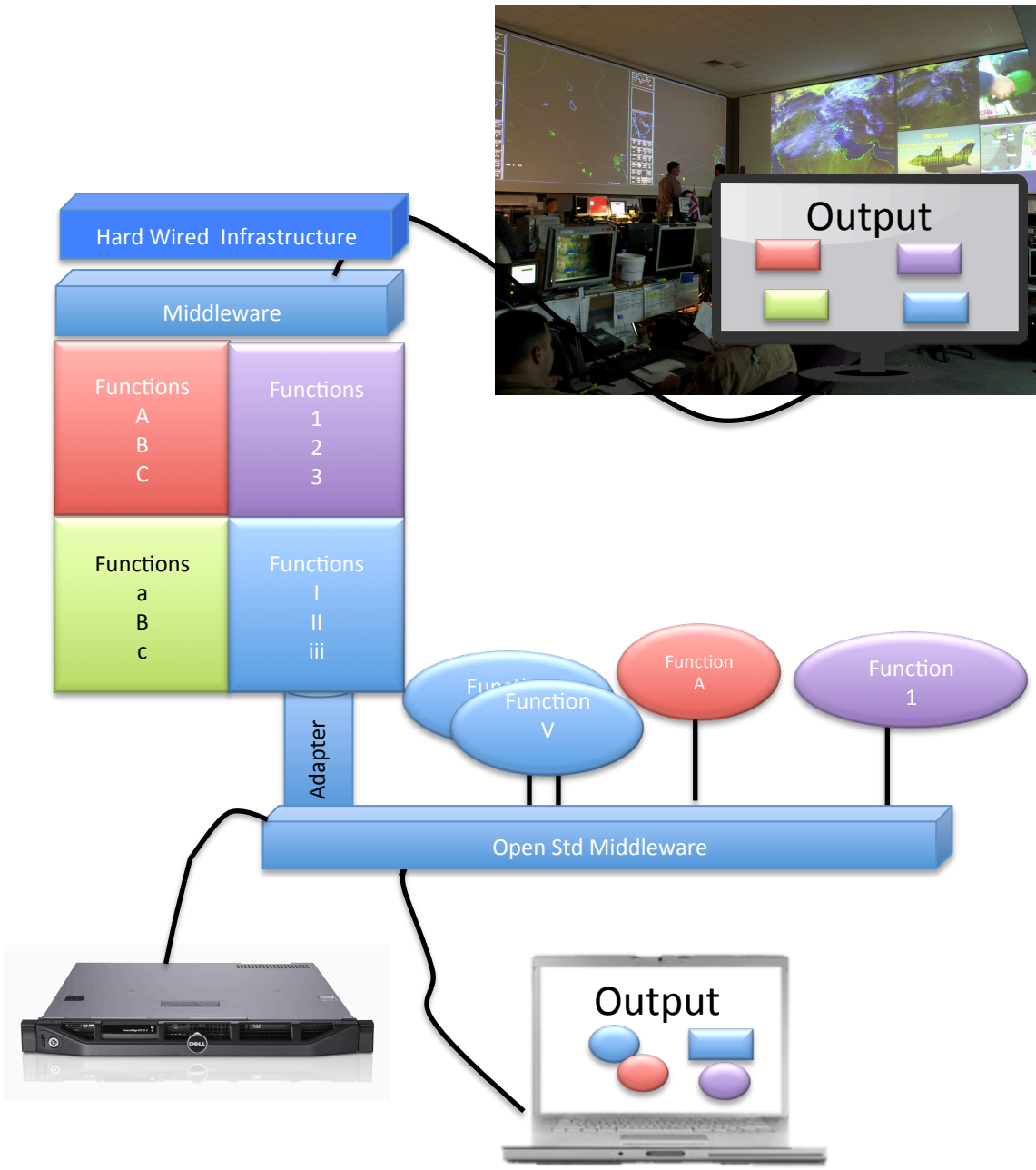
- Take “brownfield” approach, i.e. “connect” to legacy system; gradually evolve to fully open system.
- Identify worthy components of legacy architecture that might adapt to open interfaces.
- Design and budget for iterative development of modular components and open interfaces per PLA.
- Compose multiple small procurements that require performer(s) to develop the requisite interfaces for “plugging in” new capability.
- Development = RDT&E investment that delivers interoperable COTS/GOTS.
- Transition = License for improved COTS/GOTS.
- Sustainment = License includes lifecycle tech refresh.



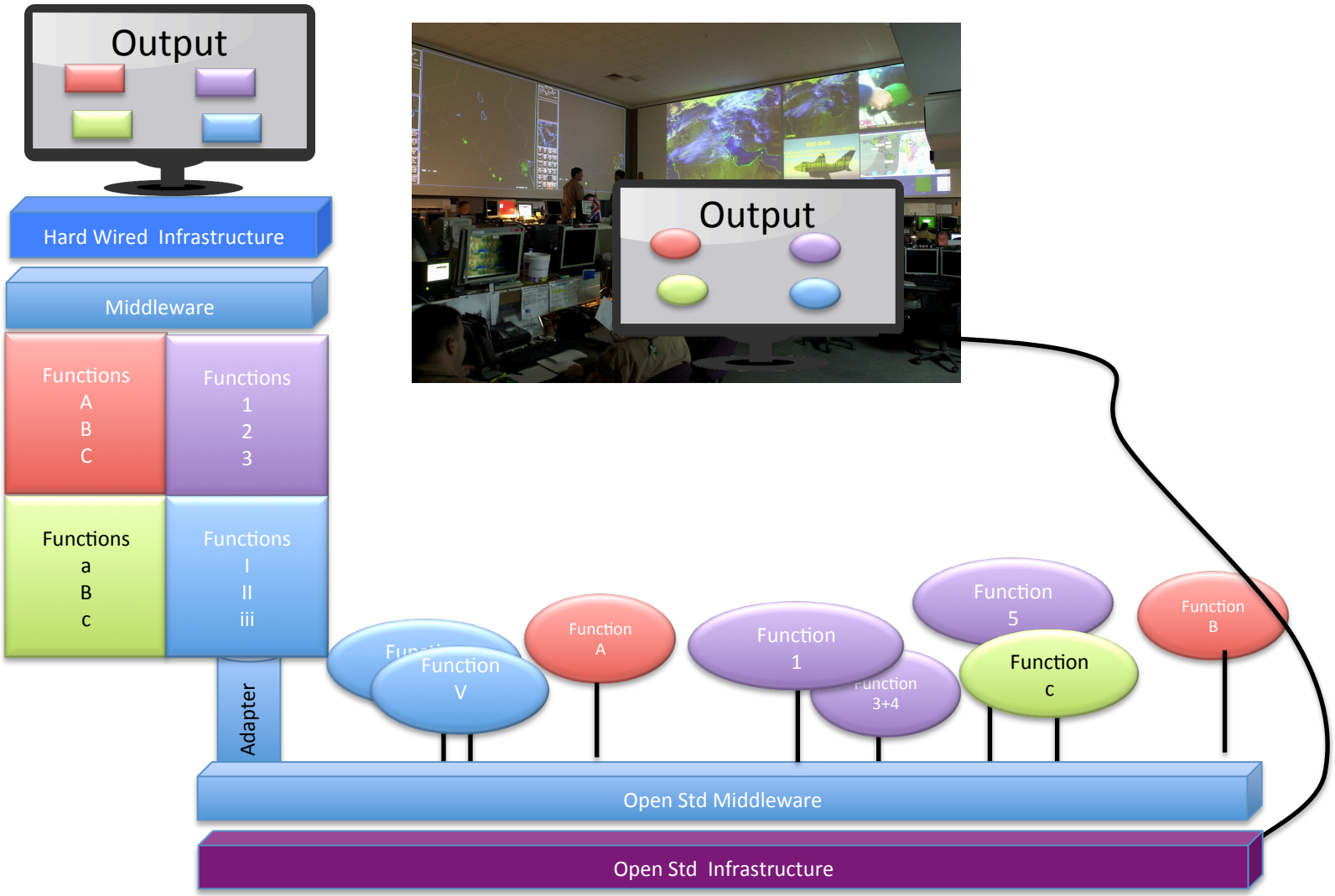
Legacy “closed” system. Characterized by relatively “hardwired” system components and information product delivery.



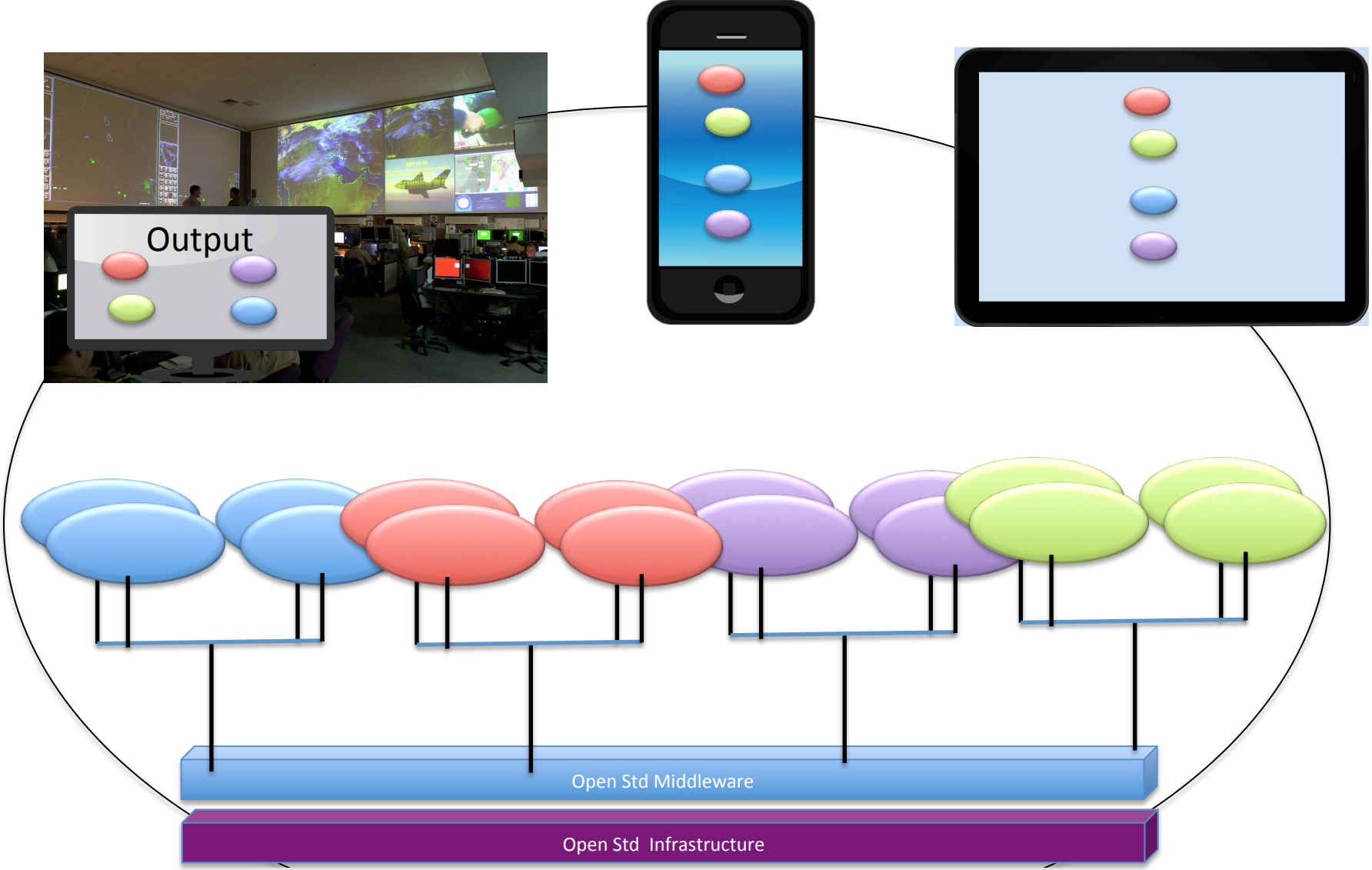
First incremental delivery of "open system" modular components via "one-off" adapter. May also require one-off hardware device(s) to provide temporary infrastructure.



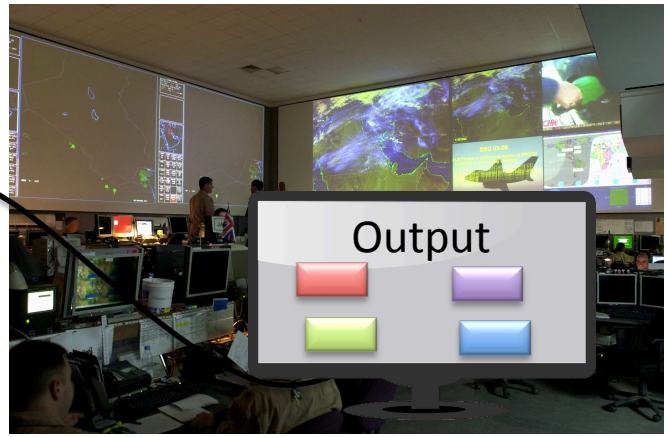
Continuing incremental deliveries of open system modular components gradually adds both new functionality, and re-hosts legacy functionality.

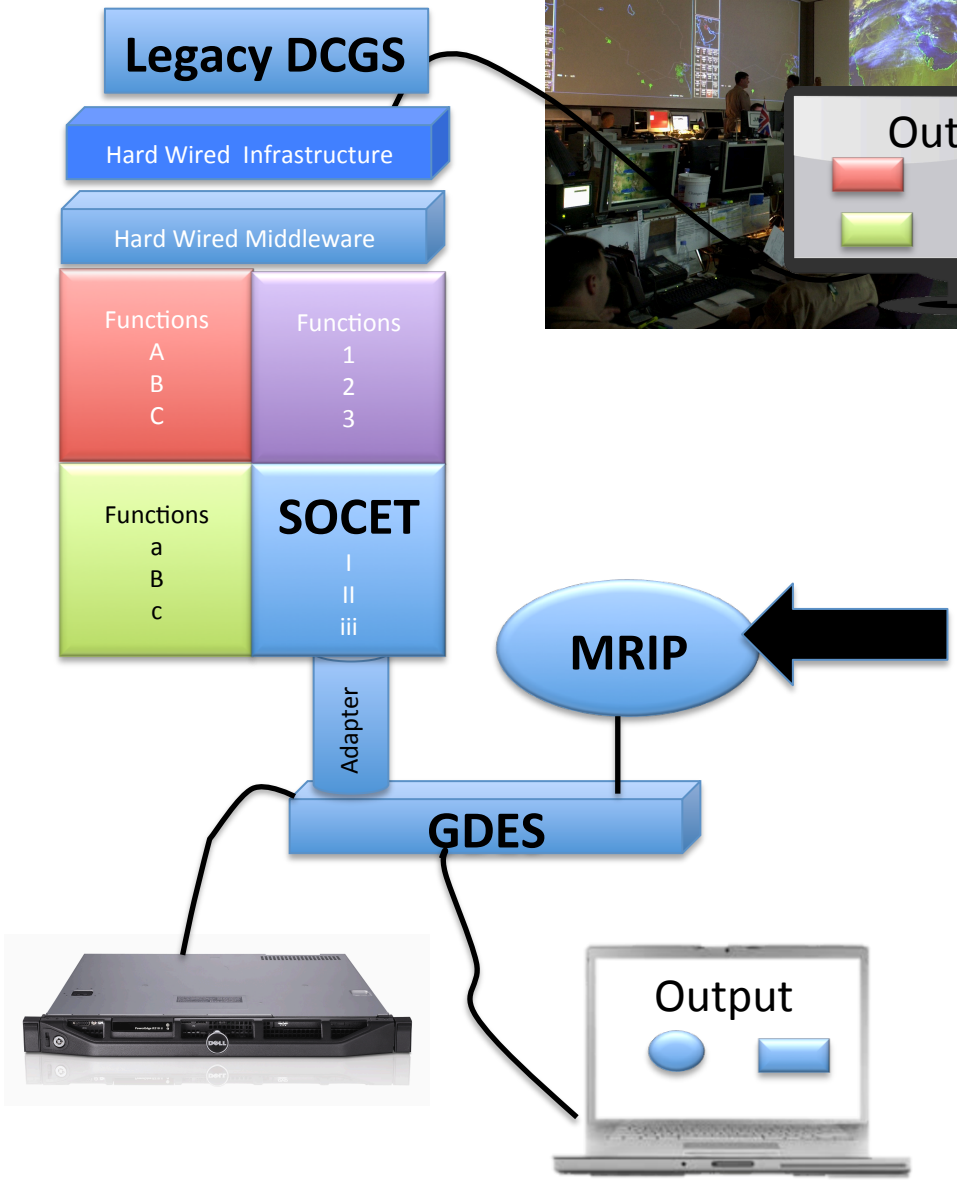


Open system PLA begins to mature. Open system infrastructure begins to evolve.



Legacy system retired. PLA, including open infrastructure, is mature. Open system is characterized by continuous improvement and broad interoperability





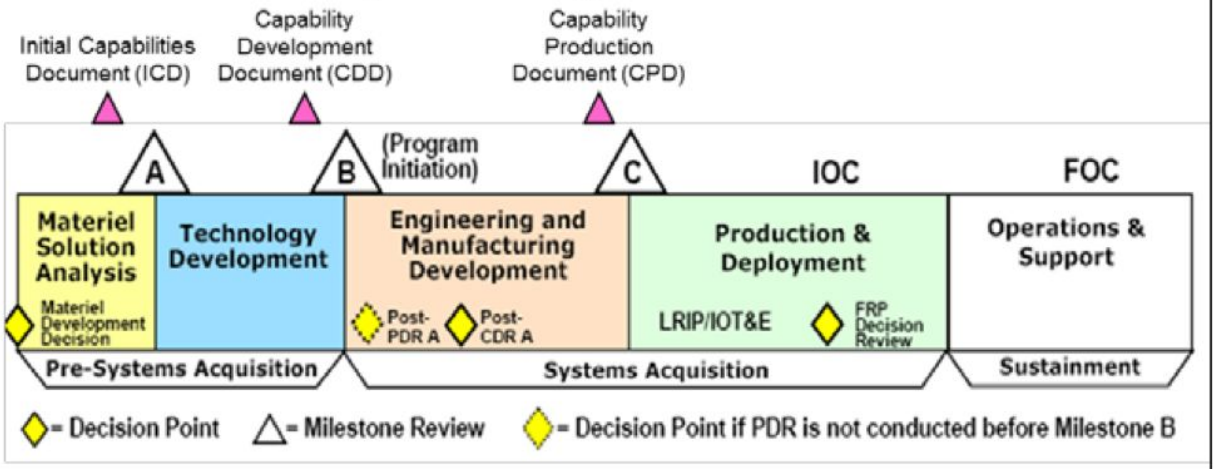
PFP aims to make first incremental delivery of "open system" modular component to legacy DCGS Weapon System!

BACKUP

Alignment of RMF and DoD Acquisition System Activities

Joint Capabilities Integration and Development System

PDR	– Preliminary Design Review
CDR	– Critical Design Review
LRIP	– Low-Rate Initial Production
IATT	– Interim Authorization to Test
IOT&E	– Initial Operational Test & Evaluation
FRP	– Full-Rate Production
RFP	– Request for Proposal



RMF Step 1 - Categorize system

Program Acquisition IA Strategy

RMF Step 2 - Select security controls

Specify system security baselines in JCIDS

RMF Step 3 - Implement security controls

ISSE/SSE translates security controls to design requirements and integrates into system specifications

System security specifications in RFP

Coordinate TEMP and Security Assessment Plan

Approve system security design at review points

RMF Step 4 - Assess security controls (issue IATTs as needed)

Developmental Test & Evaluation (DT&E)

RMF Step 5 - Authorize system (issue ATO)

Operational Test & Evaluation (OT&E)

RMF Step 6 - Monitor security controls

JCIDS IT Box IS Requirements/ Acquisition Process