Naval Open Architecture
Overview on OA

14 February 2006

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Program Manager, Naval Open Architecture
PEO IWS

The intent of this presentation is to provide an overview on the Navy's OA Enterprise initiative and assessing programs

PART I: Overview on the OA Initiative

- OA Enterprise Team (OAET)
- OA Strategy
- OA Transformation Roadmap
- OA Measures
- Benefits of OA

PART II: Assessing Your Program

- How do you know your program is truly open?

PART I: Overview of the OA Initiative

Navy leadership is under continued pressure to control the rising costs of weapon systems and platforms…

"Among the greatest risks we face is the spiraling cost of procurement for modern military systems, and shipbuilding is no exception. Shipbuilding cost increases have grown beyond our ability to control as compared to decades prior."

— Former CNO, ADM Clark, Statement Before the Senate Armed Services Committee, 10 February 2005

"*The Committee is concerned over the affordability of the Navy's future shipbuilding program. The Committee encourages the Navy to redouble its efforts to lower costs for ship classes on the drawing boards, to provide a more affordable plan for the future."*

- Report of the Committee on the DOD Appropriations Bill, 2006, 10 June 2005

"*Cost increases incurred while developing new weapon systems mean DOD cannot produce as many of those weapons as intended nor can it be relied on to deliver to the warfighter when promised. We must either make tough decisions now to increase the chances for programs to be executable within fiscal realities or brace ourselves for more draconian decisions later driven by those fiscal realities."*

- DOD Acquisition Outcomes, A Case for Change, Statement of Katherine V. Schinasi, Managing Acquisition and Sourcing Management, GAO, 15 Nov 2005

…and meet the needs of the warfighter

Implementation of open architecture across the Navy, is and will remain, a key tenet of transformation…

Business Principles

- Increased **access** to technologies and products supported by many suppliers
- Integration and use of commercial products from multiple sources both in the initial design and in future enhancements
- Use of integrated product teams and peer reviews
- Software re-use
- Increased competition
- OA language in legacy and new contracts

Technical Principles

- Development of modular architectures to allow for affordable interoperability
- Flexible and robust system designs to accommodate for changing technology and requirements
- Defined and published system and component interfaces
- Widely adopted industry standards
- Spiral developments to enable technology insertion as commercial products mature and new products become available

…that will help drive costs down while increasing capabilities

In August 2004, leadership established the Naval Open Architecture Enterprise Team to drive the overall OA strategy

ASN (RD&A)

OA LEAD COUNCIL

RDML Frick, PEO-IWS, Enterprise Lead	RDML See, Space Domain
RADM Venlet, Air Domain	RDML Hilarides, Submarine Domain
Dennis Bauman, C4I Domain	

OA ENTERPRISE TEAM

CAPT JIM SHANNON, CHAIRMAN OAET, PROGRAM MANAGER OA
Bill Johnson, Director of OA
LCDR Corsano, Deputy Director OA

AIR LEAD	C4I LEAD	MARINE CORP LEAD	SPACE LEAD	SUB LEAD	SURFACE LEAD
Mark Milton	Chris Miller	Tom Irwin	Bryan Scurry	LCDR Christiansen	CDR Ailes

Each Domain is responsible for implementing OA!

Implementation of open architecture was a key aspect of the Department's 2005 objectives

Department of Navy 2005 Objectives

- Objective 1. Global War on Terrorism: Continue to aggressively prosecute the global war on terrorism.
- Objective 2. Homeland Security: Use the Memorandum of Agreement (MOA) negotiated with the Coast Guard in 2004 as the foundation for broadened relationships with international Navies to develop an integrated intelligence and Command and Control System to assist in GWOT.
- Objective 3. Safety
- Objective 4. Human Capital Strategy
- Objective 5. Shipbuilding: Formulate, articulate and incorporate into PR 07 a comprehensive shipbuilding program to encompass all aspects of sea basing and quick reaction to trouble spots.
- Objective 6. Base Realignment and Closure (BRAC)
- Objective 7. Quadrennial Defense Review: Leverage the Quadrennial Defense Review (QDR) to effectively influence DOD and DON strategic direction. Maximize joint warfighting interoperability while emphasizing unique maritime capabilities and DON operational considerations. Use QDR analyses to better understand and reconcile capability-based force posture requirements. Drive the QDR process to facilitate near and long-term force shaping and strategic response capability.
- Objective 8. Analytical Tools And Modeling: Develop analytic tools to model and determine future warfighting requirements and capabilities to counter conventional, asymmetric, catastrophic, etc. risk areas.
- Objective 9. Information Technology (IT): Transform the enterprise business IT functions of the Navy.
- Objective 10. Alignment: Align organizations and processes to ensure service collaboration on key joint concepts and capabilities

  - **Continue transformation of Naval combat and weapon systems through the aggressive implementation of open architecture precepts across the enterprise.**

Source: http://www.navy.mil/palib/people/secnav/england/2005_don-objectives.txt

In developing the OA strategy, it is important to understand where we are today…

Today's Environment:

- **Business**
  - Continuously challenged with budgetary decisions
  - Inflexible acquisition strategies that "lock the Navy in"
  - Limited competition that impede innovation
  - Procure systems that are not affordable in production and modernization
  - Procure systems for similar capabilities across the enterprise
  - Limited software reuse across programs or domains
  - Limited access and sharing of data across programs or domains
  - Few enterprise processes to foster integration among programs and domains

- **Technical**
  - Incompatible systems that are not interoperable
  - Monolithic or closed systems that are not rapidly or economically upgradeable
  - Closed systems that cannot leverage advances in technology
  - Special use code and system modules that cannot be reused across the Navy

…and where we want to go

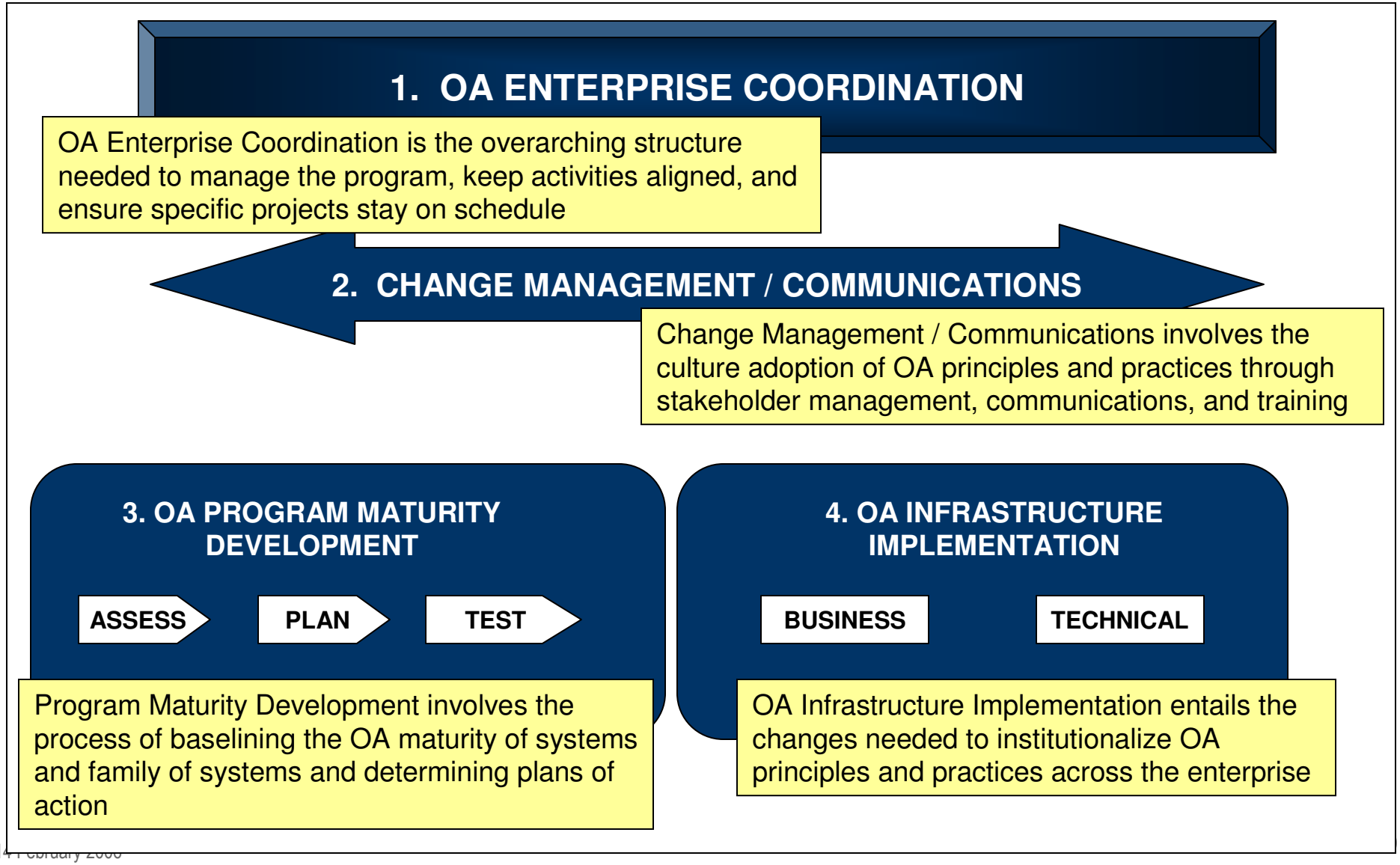
Future Environment:

- Business
  - Enterprise-wide plans based on cost/capability analysis of programs that address capability, affordability and stabilization
  - Flexible acquisition strategies and contracts that enable the Navy to reuse software, easily upgrade systems and share data among the enterprise
  - Streamlined investments in similar capabilities
  - Increased competition to foster innovation and leverage tech refreshes
  - Established enterprise processes and governance to foster integration
- Technical
  - Layered and modular open architectures that address portability, maintainability, interoperability, upgradeability and long-term supportability
  - Modular, open designs consisting of components that are self-contained elements with well-defined interfaces
  - Maximum use of commercial standards and commodity COTS products
  - Continuously conform with Information Assurance (IA) requirements and monitor technology developments for IA improvements

The driving energy for OA is competition!

The OA Roadmap is our plan for reaching our end-state

OA Transformation Roadmap



Component 1 involves coordinating the transformation across the Naval Enterprise and with other services

1. OA ENTERPRISE COORDINATION

FY 06 ACTIVITIES

1.1 Execute OA Strategy
- Execute ASN (RD&A) OA vision
- Execute OPNAV OA requirements
- Execute OA EXCOMM Action Items
- Build FY06 Master Integrated Plan

1.2 Support ASN (RD&A) / OA Lead Council
- Support OA EXCOMM Meetings
- Submit Monthly OA Metrics/ Reports

1.3 Manage OA Enterprise Team (OAET)
- Conduct OAET Monthly Meetings
- Conduct Quarterly Program Reviews
- Manage OAET Integrated Workplan
- Manage FY 06 OA Budget
- Manage OAET Risk Plan

1.4 Coordinate OA Initiative with FORCEnet
- Attend FORCEnet EXCOMM Meetings
- Participate in C4I Virtual Syscom
- Align tasks, where applicable

1.5 Coordinate Naval OA Initiative with Other Services
- Coordinate with OSD, OSJTF
- Coordinate with Marine Corps
- Coordinate with Army
- Coordinate with Air Force

Component 2 includes managing change and communications with our stakeholders

2. CHANGE MANAGEMENT / COMMUNICATIONS

FY06 ACTIVITIES

2.1 Manage OAET Stakeholder Plan

- Update Stakeholder Plan
- Conduct Assessments
- Develop Mitigating Action Plans
- Execute Action Plans

2.2 Manage Ongoing Communications

- OA Briefs
- OA Precepts
- OA Quick Successes
- Acc.dau.mil/oa website
- Correspondence
- Communications Plan

2.3 Manage Ongoing Outreach Efforts

- OA Industry Days
- OA Symposiums
- OA Road Shows
- Conferences
- Industry Consortiums

2.4 Execute OA Enterprise Education and Training Master Plan

- Develop / field curricula for NPS & DAU
- Develop Continuous Learning modules / Workforce Awareness programs

Component 3 entails assessing the openness of programs, updating programs of record, and testing alternatives

FY 06 ACTIVITIES

3.1 Maintain analytical tools to assess programs

3.2 Conduct OA Program Assessments

3.3 Adjudicate Results of OA Assessments

3.4 Determine Business and Technical Alternatives

3.5 Identify Enterprise Components for Re-Use

3.6 Prepare POM Issue Papers and/or Business Case (s)
- Costs / Benefits
- Risk Assessment

3.7 Update Program of Record
- Adjust funding to support plan

3.8 Test OA Technical Alternatives for Risk Reduction
- Feasibility Testing
- Developmental Testing

Component 4 requires changing the business and technical landscape to support the implementation of OA

4. OA INFRASTRUCTUREIMPLEMENTATION

BUSINESS | **TECHNICAL**

BUSINESS

4.1 Assess prime integrator vs. end-to-end developer roles

4.2 Develop enterprise OA contract language

4.3 Establish process for conducting data rights requirements analysis

4.4 Develop framework for OA contract incentives

4.5 Develop OA Award fee criteria

TECHNICAL

4.6 Develop OA Enterprise Component Library

- Inventory existing repositories
- Develop ConOps and CM processes
- Define data structures and technical detail
- Identify OA Artifacts
- Build, deploy and populate repository and toolset

4.7 Align Domain standards

4.8 Align standards to DISR

Successful implementation of OA requires sound measures to monitor and gauge success

ILLUSTRATIVE

- Program assessment metrics using OA Model and OA Tool
- Decreased cycle time to deliver warfighting capabilities (time to market)
- Cost avoidance from software re-use and use of commodity COTS
- Reduction of warfare system baselines
- Streamlined investments for similar capabilities, system upgrades, test and evaluation

Implementation of OA will yield many benefits to the Navy as demonstrated by the ASW community

- Performance
  - Best of breed applications through continuous competition
  - Increased ability to respond to warfighter capability gaps and/or priorities
- Schedule
  - Timely system integration of OA compliant spiral software upgrade s
  - Rapid update deliveries driven by user operational cycles
- Cost avoidance mechanisms
  - Software – develop once, use often, upgrade as required
  - Hardware – use high volume COTS products at optimum price points
  - Training systems use same tactical applications and COTS hardware
  - Design for Maintenance Free Operating Periods
  - Consolidated Development and Operational Testing for reused applications
- Risk reduction
  - Field new applications only when mature
  - Don’t force the last ounce of performance

Moving forward, we must continually build off lessons learned in the past

OA LESSONS LEARNED

- Establish enterprise Communities of Interest (COIs)
  - Base COIs on mission areas – Strike, ISR, AAW, ASW etc.
  - Include the warfighter at EVERY step
  - Plan for enterprise-wide reuse of government owned software
  - Use MOSA principles - modular design, open standards, key interfaces
  - Incentivize Program Managers for enterprise vice platform/program success
  - Use Business Case Analyses to determine OA priorities
- Contracts
  - Incentivize cooperation among integrators & developers
    - Develop award fees based on group success
    - Maintain continuous competition for application development
    - Conduct independent peer review of products using real data
  - Ensure data rights support open architecture and 3rd party use
    - Full disclosure – Early and Often

PART II: Assessing Your Program

A first step in implementing OA is to understand "how open is my program today"

Illustrative Examples

- For components which are expected to evolve to meet new or unforeseen performance requirements, does the Navy have exclusive ownership of any software or documentation being developed or used to build the system?
- Are proprietary components well defined, limited in scope, and designed so that others are not precluded from interfacing with the component or other parts of the system?
- Are your program's design artifacts disclosed "early and often" and freely available for re-use by another program or third parties?
- Does the program use widely-accepted and supported standards to define interface definitions or key interfaces that are published and maintained by recognized organizations?
- Does your program encourage continuous competition for components, modules, and tasks? Is it easy for your follow on contract to go to anyone other than the incumbent?

In order to help Program Managers understand "how open their programs are…"

Highlights of EXCOMM II Action Items

Decision 3: OA efforts need to be guided by a well-defined business strategy.

Action: Prepare, staff and promulgate a Navy-wide business strategy to support OA goals.

Business Strategy shall:

- Define an acquisition strategy addressing incentives, intellectual property issues, contracting (integrators vs. primes), and funding alternatives.
- Incorporate inputs from each lead PEO on current application of OA within its programs and identify if any OA redirection is needed or desired with associated costs. This includes a business case analysis for OA implementation across the Enterprise that is based on established criteria.
- Provide a prescribed format to be used by PEOs for OA compliancy waivers.
- Determine total cost estimate of projected OA effort for input to PR-07. Industry and academia participation is required.
- Provide programs with analysis tools needed to make OA tradeoffs.

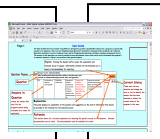
Lead: PEO IWS
Follow: Enterprise Team
Due Date: 31 August 2004

See August 5, 2004 ASN (RD&A) Memorandum, Summary of OA EXCOMM II

…leadership tasked the OAET to develop analytical tools

The Navy has developed the OA Assessment Model and OA Assessment Tool to assess the current "open state" of programs

OA Assessment Model (OAAM)



Official Release (V1.0) – Mar 8, 2005

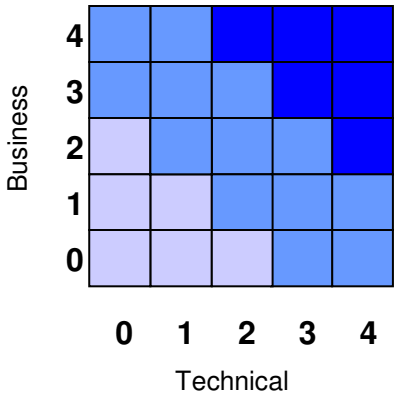
- Application – PowerPoint
- Overview –Graphical depiction with business and technical characteristics
  - Bus Characteristics - 23
  - Tech Characteristics - 27
- Purpose – Concisely depict a program's openness on the 5 x 5 matrix model

OA Assessment Tool (OAAT)

- Official Release (V1.0) – Dec 8, 2005
- Application – Excel
- Overview – Automated tool comprised of business and technical questions
  - Bus Questions - 30
  - Tech Questions - 18
- Purpose – Analyze a program's openness according to the user's response
- Directly linked to the Modular Open Systems Approach PART

Collectively, these tools assist Program Managers in determining alternatives to increase OA maturity of programs

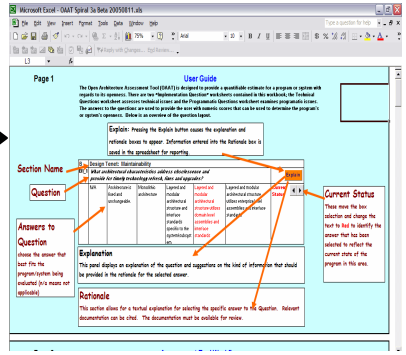
OA Assessment Model



- Graphical depiction of the current OA maturity state
- Identifies progression towards openness

and

OA Assessment Tool



- Set of business and technical questions to help PMs understand how to become more open
- Official Version 1.0 released December 08 2005

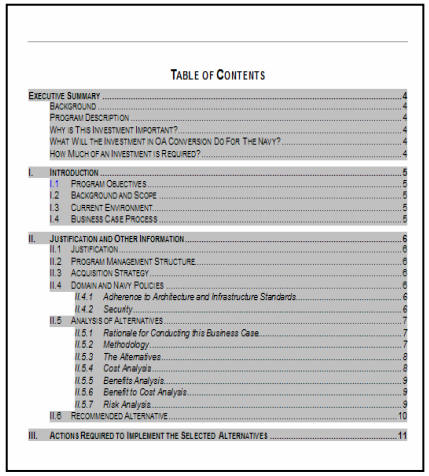
Help determine

Where is my program today?

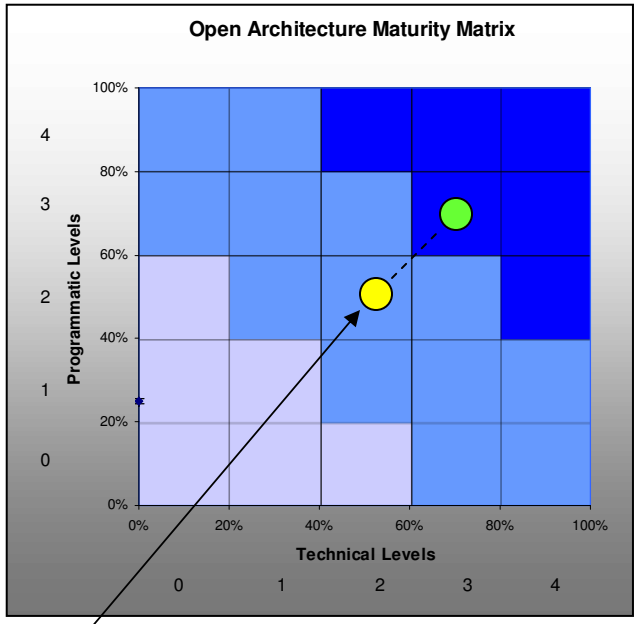
What are the alternatives for advancing towards OA?

Is a business case needed?

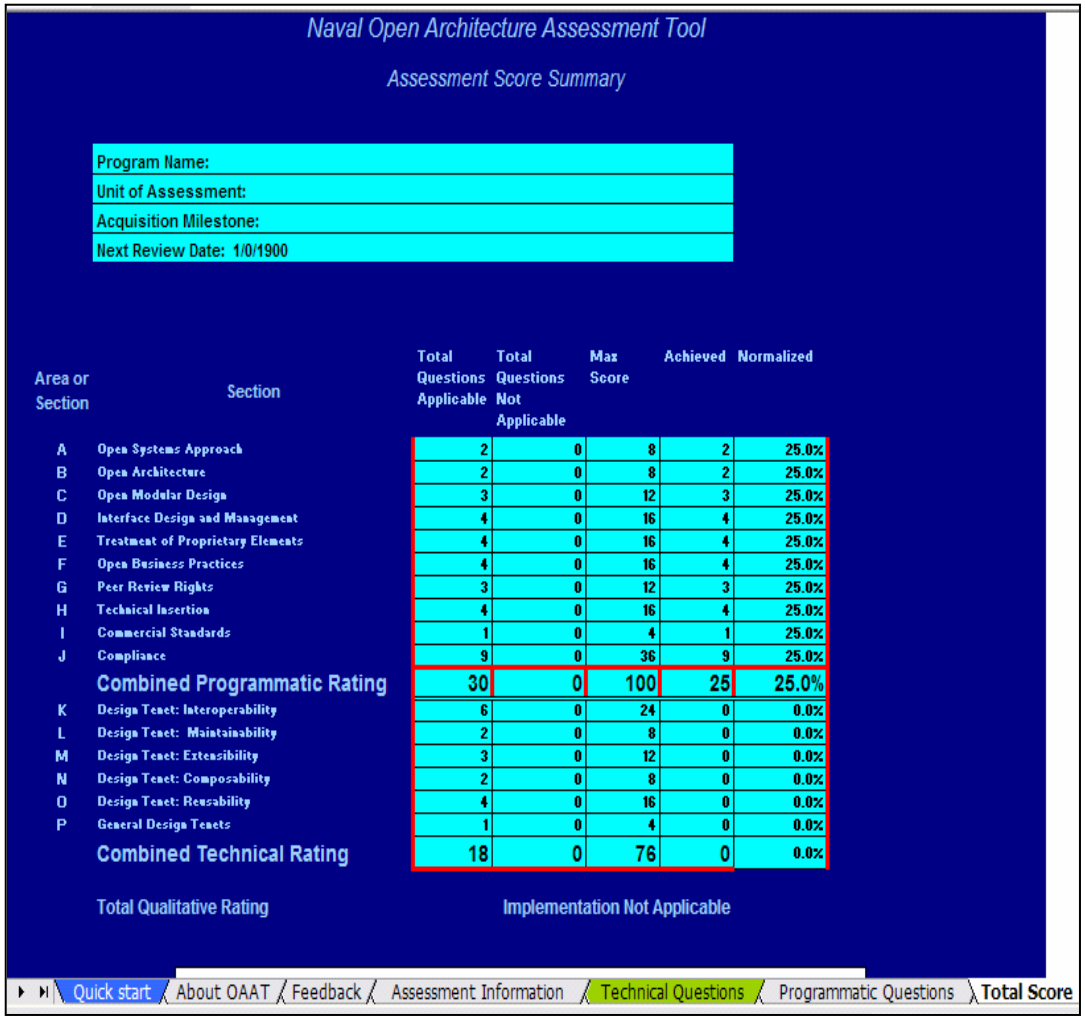
BCA Template



An assessment using the OA Model and Tool will produce a metric and final report



- Today, my program is a 2-2
- In the future, my program should be a 3-3, what can I do to become more open?



OA Assessment Report detailing answers to the business and technical questions

The required assessments and metrics will be used by leadership to understand a program's openness

15 May 2005 ASN (RD&A) Memorandum for Distribution, Summary of OA EXCOMM III of 22 February 2005

3) Produce metrics for all ACAT I programs and conduct business cases analyses (BCAs) if necessary. Produce metrics for ACAT II, III, and IV programs and conduct BCAs as coordinated by the OAET.

Lead: PEO IWS, PEO T, PEO C4I & Space, PEO Subs, PEO Space Systems
Follow: PEO LMW, PEO Carriers, PEO Ships, PEO A, PEO W, PEO Strike, DRPM JSF, OPNAV N6/7

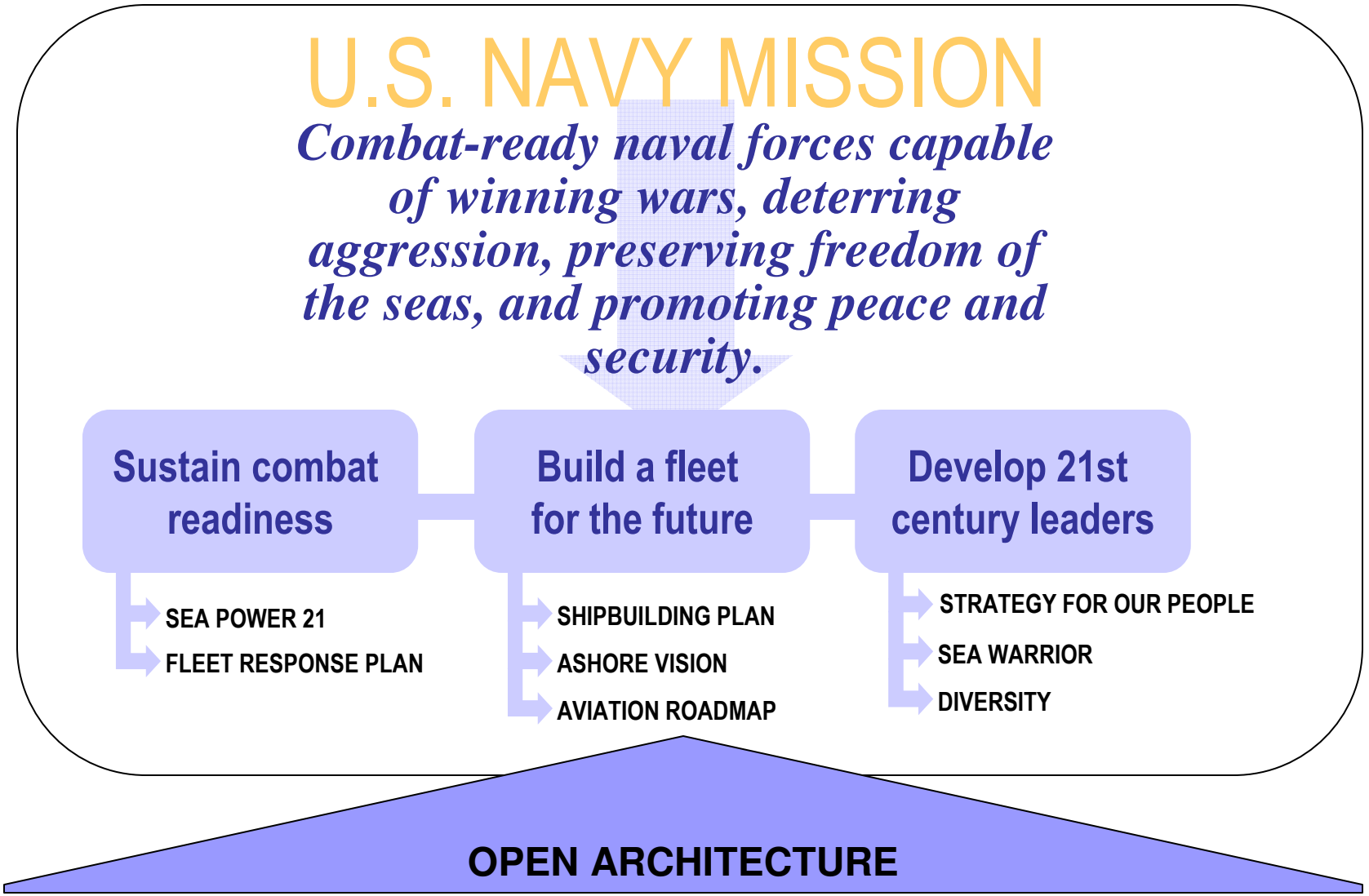
23 December 2005 Deputy Chief of Naval Operations (N6/N7), Requirement for OA Implementation

c. The OPNAV OAC will coordinate with PEO-IWS 7.0 and the OAET to assist the Milestone Decision Authority (MDA), program manager, and resource sponsor in assessing a program's openness, where appropriate.

d. PEO IWS 7.0, in coordination with the OAET, shall:

Provide assessment tools and assistance to PEOs and SYSCOMs as they perform OA assessments of their portfolio of ACAT programs. Each PEO shall coordinate a schedule for performing these OA assessments and complete them in order to support the POM 08 and subsequent budget cycles.

In summary, OA will continue to be a key enabler in meeting the three priorities laid out by the CNO for FY06…



…and several key related objectives

CNO Guidance for 2006

Meeting the Challenge of a New Era

I. Introduction

We are a nation and a Navy at war. Whether providing sovereign deck space from which to launch strikes in Afghanistan, continuing to support ground operations in Iraq, patrolling the seas to interdict terrorists, or shaping the maritime domain through swift humanitarian action in Indonesia and on our own Gulf Coast, we are contributing to joint and combined operations in ways no one could have imagined a few short years ago.

We live on the cusp of a new era. It is an era plagued by uncertainty and change and unrestricted warfare, an era of shifting global threats and challenging new opportunities. It is an era that calls for new skill sets, deeper partnerships, mutual understanding and -- with the great majority of international commerce still moving on the world's oceans -- a firm commitment to the incredible power resident in the sea itself.

Harnessing sea power in the 21st century will demand much more of us than simply putting ordnance on target -- though clearly that remains a core capability. It will demand the ability to aggregate and disaggregate forces quickly; it will demand highly sophisticated networks, connectivity and stealth; it will demand better joint, allied and coalition interoperability; and it will demand that we build for the future a new fleet of ships, aircraft and submarines to wield that power across the spectrum of conflict.

It is with my firm belief in our ability to meet these challenges that I have crafted my Guidance for 2006. Rooted in the framework of **Sea Power 21**, this document articulates our vision, reiterates our mission, establishes the guiding principles that will underpin our actions and restates my top three priorities (supporting each with specific objectives, desired effects and tasking). Please distribute it and share it widely.

II. Vision

The vision we seek is: **Americans secure** at home and abroad; **sea and air lanes open and free** for the peaceful, productive movement of international commerce; **enduring national and international naval relationships** that remain strong and true; **steadily deepening cooperation** among the maritime forces of emerging partner nations; and a **combat-ready Navy -- forward-deployed, rotational and surge capable** -- large enough, agile enough, and lethal enough to deter any threat and defeat any foe in support of the Joint Force.

2006 Key Objectives

1. **Win the war on terror and stay ready to meet other operational requirements;**
2. **Determine and deliver on the Navy's future force structure requirements;**
3. **Drive to execution Sea Warrior and other ongoing manpower and personnel transformational efforts;**
4. With the USMC, increase the value of naval contributions to the Joint Force;
5. Develop closer working relationships with the USCG and other governmental and non-governmental organizations;
6. Apply effects-based thinking across the Navy; and
7. Become leaders of change and innovation.


PROGRAM EXECUTIVE OFFICE
PEO
IWS
INTEGRATED WARFARE SYSTEMS

The Open Architecture Enterprise Team Points of Contact

ENTERPRISE		
Bill Johnson	Enterprise Lead	william.m.johnson4@navy.mil
LCDR Corsano	Enterprise Representative	Scott.Corsano@navy.mil
AIR DOMAIN		
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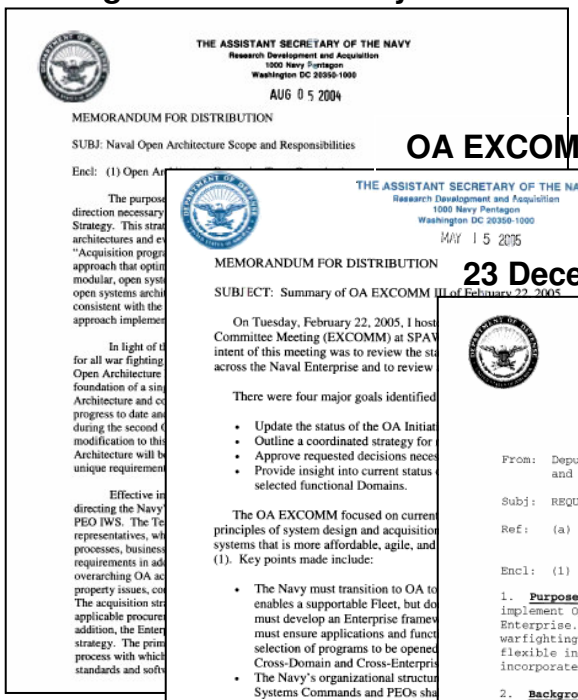
Paul Gooder	Sub Domain Representative	pgooder@egginc.com
SURFACE DOMAIN		
CDR Ailes	Surface Domain Lead	john.ailes@navy.mil
Aaron Anderson	Surface Domain Representative	aaron.s.anderson@navy.mil

Naval OA requirements and program responsibilities are derived from three primary sources

5 August 2004 OA Policy Statement



THE ASSISTANT SECRETARY OF THE NAVY
Research Development and Acquisition
1000 Navy Pentagon
Washington DC 20350-1000

AUG 0 5 2004

MEMORANDUM FOR DISTRIBUTION

SUBJ: Naval Open Architecture Scope and Responsibilities

Encl: (1) Open Ar

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OA EXCOMM Action Items

THE ASSISTANT SECRETARY OF THE NAVY
Research Development and Acquisition
1000 Navy Pentagon
Washington DC 20350-1000

MAY 1 5 2005

MEMORANDUM FOR DISTRIBUTION

SUBJECT: Summary of OA EXCOMM III of February 22, 2005

On Tuesday, February 22, 2005, I host
Committee Meeting (EXCOMM) at SPAV
intent of this meeting was to review the st
across the Naval Enterprise and to review

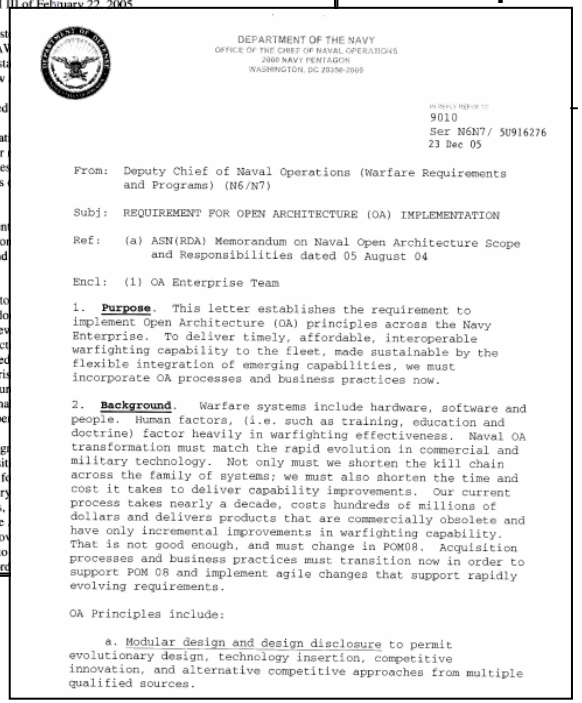
There were four major goals identified

- Update the status of the OA Initiat
- Outline a coordinated strategy for
- Approve requested decisions neces
- Provide insight into current status
  selected functional Domains.

The OA EXCOMM focused on current
principles of system design and acquisitio
systems that is more affordable, agile, and
(1). Key points made include:

- The Navy must transition to OA to
  enables a supportable Fleet, but do
  must develop an Enterprise framew
  must ensure applications and funct
  selection of programs to be opened
  Cross-Domain and Cross-Enterpris
- The Navy's organizational structur
  Systems Commands and PEOs sha
  commands. They shall also coope
  capabilities.
- Contract business models for prog
  determine if they foster that transit
- There is an enterprise-wide need f
  and non-tactical IT, aligns Industry
  between C4I and combat systems,
  each other. I intend to engage the
  establish an enterprise-wide IT gov
- FORCEnet and OA must map into
- The Enterprise will present a coord

23 December 2005 OPNAV Requirements



DEPARTMENT OF THE NAVY
OFFICE OF THE CHIEF OF NAVAL OPERATIONS
2000 NAVY PENTAGON
WASHINGTON, DC 20350-2000

9010
Ser N6N7/ 5U916276
23 Dec 05

From: Deputy Chief of Naval Operations (Warfare Requirements and Programs) (N6/N7)

Subj: REQUIREMENT FOR OPEN ARCHITECTURE (OA) IMPLEMENTATION

Ref: (a) ASN(RDA) Memorandum on Naval Open Architecture Scope and Responsibilities dated 05 August 04

Encl: (1) OA Enterprise Team

1. **Purpose**. This letter establishes the requirement to implement Open Architecture (OA) principles across the Navy Enterprise. To deliver timely, affordable, interoperable warfighting capability to the fleet, made sustainable by the flexible integration of emerging capabilities, we must incorporate OA processes and business practices now.

2. **Background**. Warfare systems include hardware, software and people. Human factors, (i.e. such as training, education and doctrine) factor heavily in warfighting effectiveness. Naval OA transformation must match the rapid evolution in commercial and military technology. Not only must we shorten the kill chain across the family of systems; we must also shorten the time and cost it takes to deliver capability improvements. Our current process takes nearly a decade, costs hundreds of millions of dollars and delivers products that are commercially obsolete and have only incremental improvements in warfighting capability. That is not good enough, and must change in POM08. Acquisition processes and business practices must transition now in order to support POM 08 and implement agile changes that support rapidly evolving requirements.

OA Principles include:

a. Modular design and design disclosure to permit evolutionary design, technology insertion, competitive innovation, and alternative competitive approaches from multiple qualified sources.

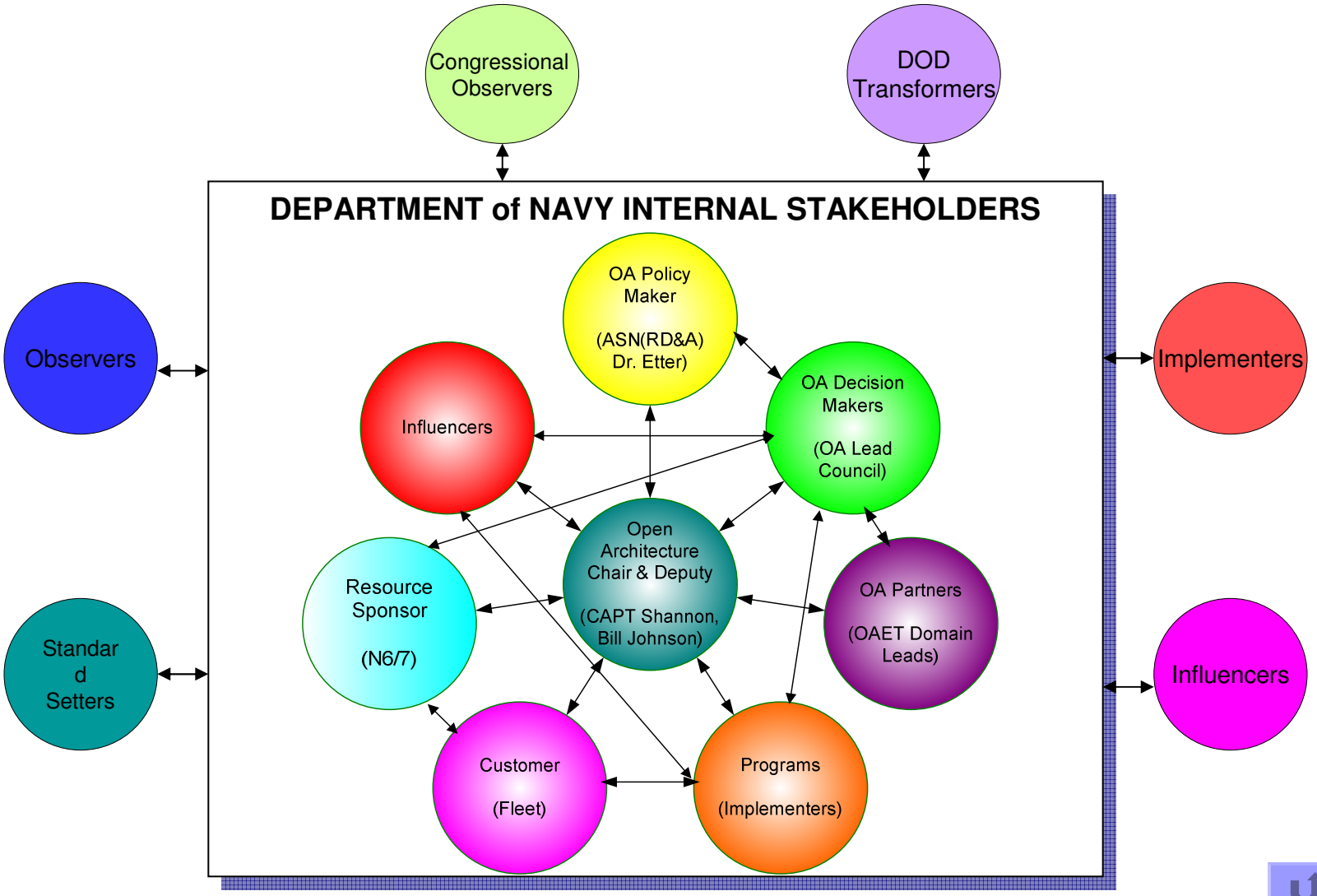
ASN RD&A OA Policy

OA EXCOMM Action Items

OPNAV Requirements

NAVAL OA Responsibilities and Requirements to execute against the strategy

Identifying and communicating with our internal and external Stakeholders is critical to successful OA implementation



OA Special Interest Area - https://acc.dau.mil/oa

Monthly average hits ~ 1200

Education and Training Master Plan

NPS / AFIT/ Civilian Universities

Postgraduate Education

- High Impact
- Long time horizon
- Develops leaders of tomorrow
- Technical competencies
- Some business competency
- In-depth education in technical or business disciplines leading to a graduate degree
- Formal classroom training, either on campus or distance learning

DAU

DAWIA Certification Training

- High Impact
- Long Time Horizon
- Qualification training for the Acquisition Workforce
- Principally business competencies
- Some technical competencies
- Broad training covering a variety of topics leading to career field certifications in specific disciplines
- Formal classroom training either on campus or distance learning

NAVY

Continuous Learning

- Medium Impact
- Short to medium time horizon
- Business or technical competencies
- Focused course work on specific topics
- Symposia and professional society meetings
- Instructor or web delivery

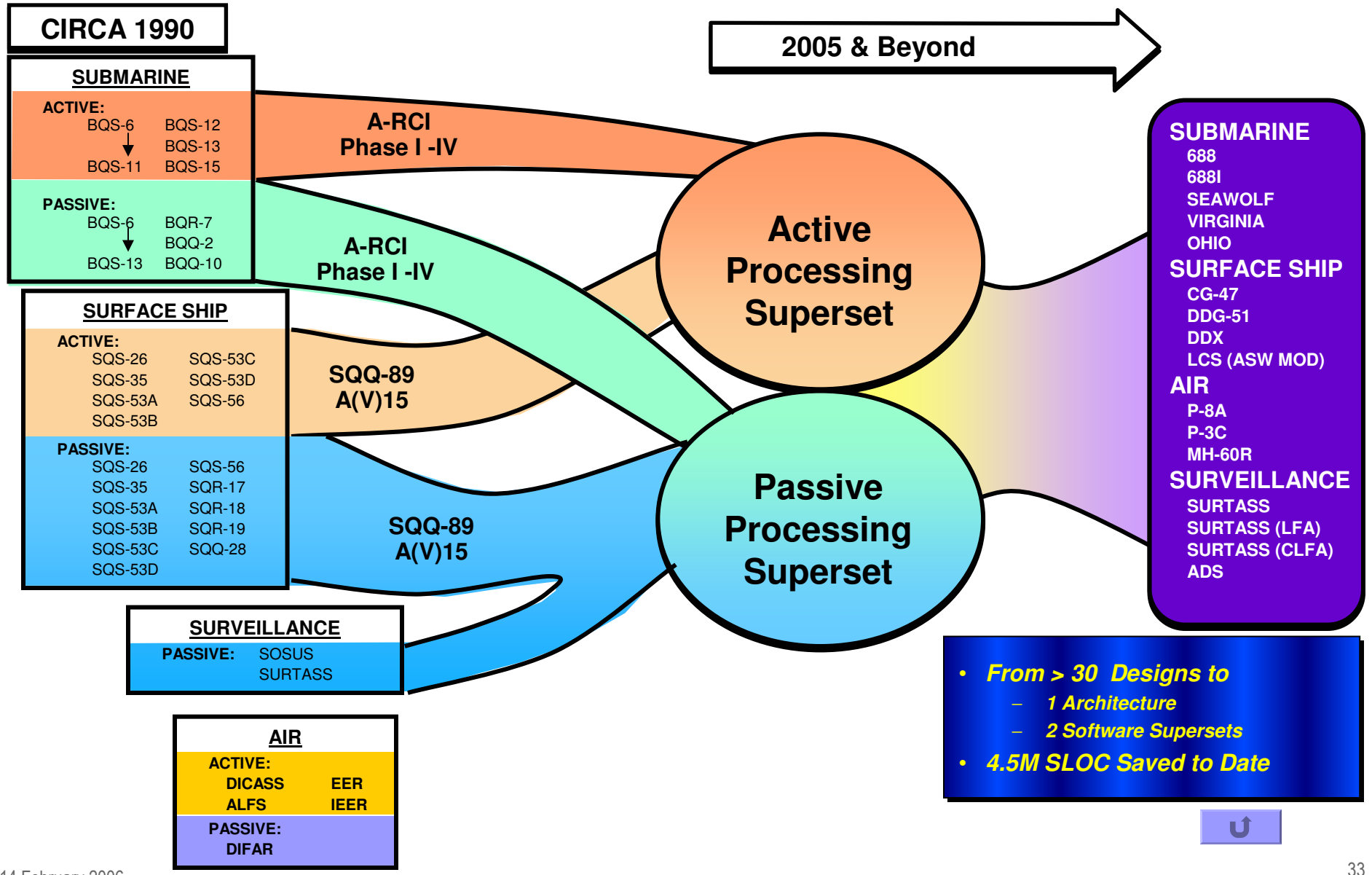
Knowledge Sharing

- Medium to high impact
- Short time horizon
- Task based
- Web based
- Learning modules or best practices

Workforce Awareness

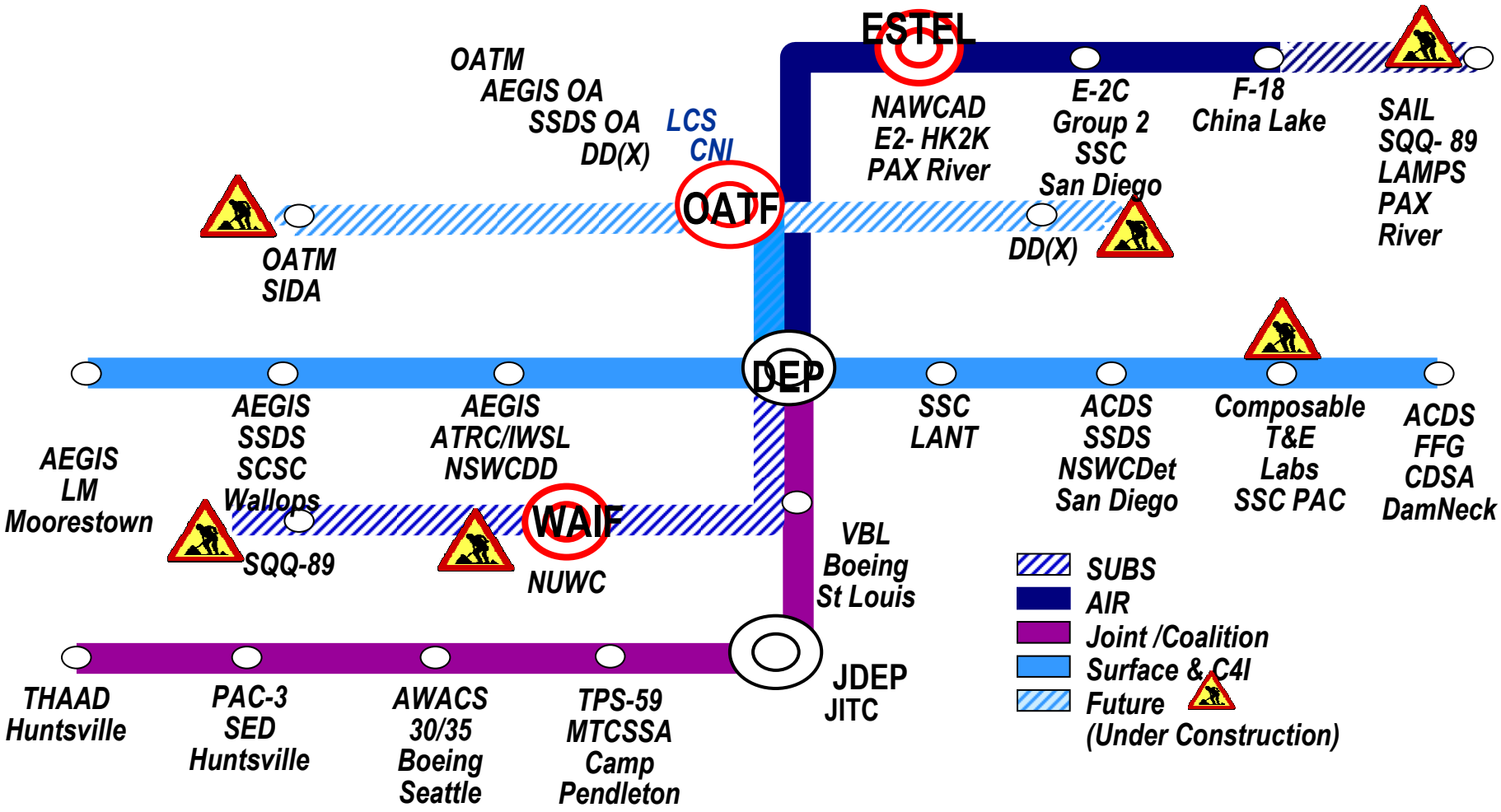
- Low Impact
- Short time horizon
- Business orientation
- Briefings and general orientation
- Instructor or web delivery

Enterprise Opportunities – ASW Common Software / Architecture



- *From > 30 Designs to*
  - *1 Architecture*
  - *2 Software Supersets*
- *4.5M SLOC Saved to Date*

Alternatives are being tested to support OA implementation through existing facilities



Transformation Through Collaboration

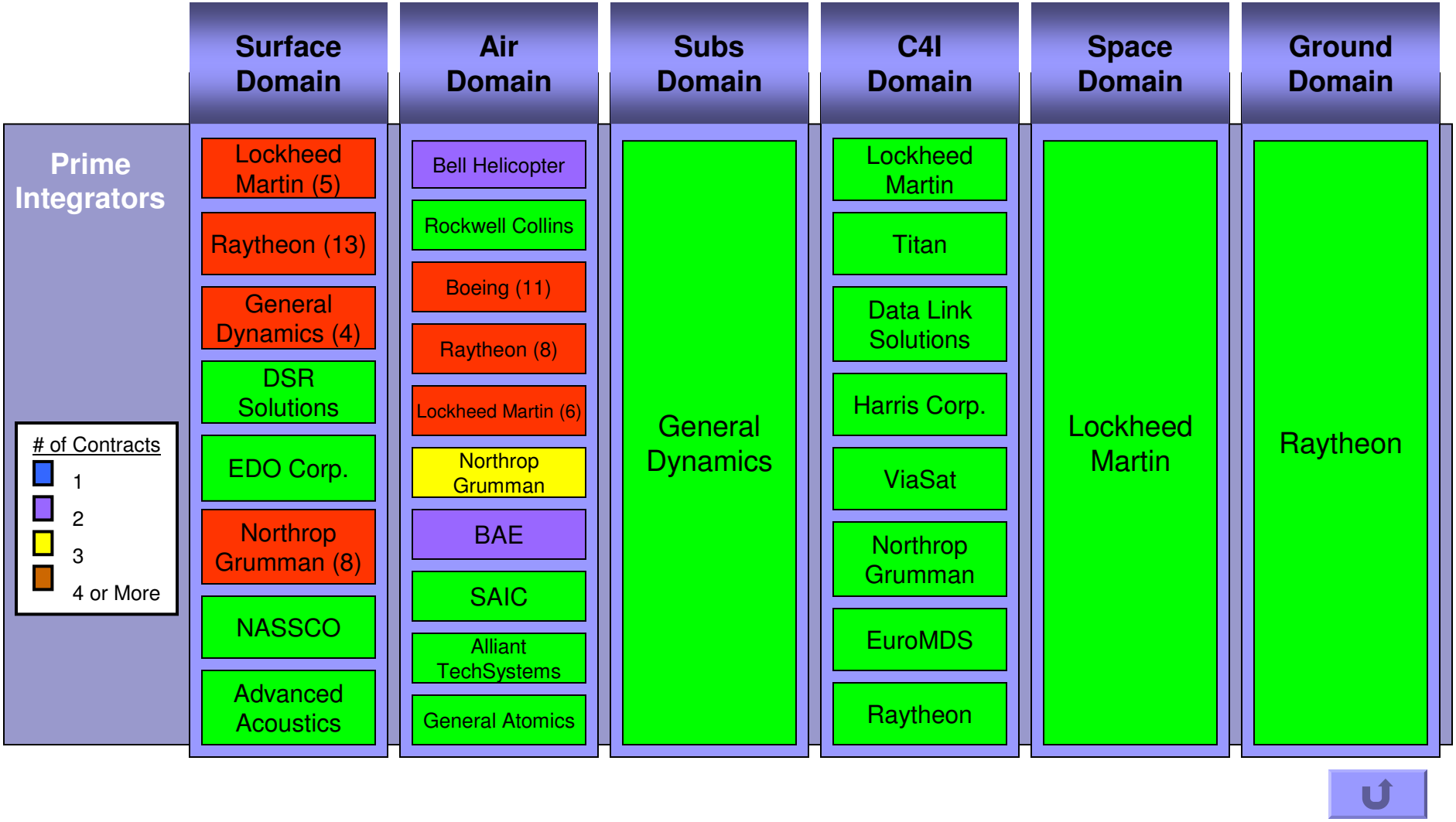
Technical goals and experiment design criteria have been developed to measure success

Possible Goals	Technology Evaluation	Systems Development	Military Utility
Fundamental Question	*Does technology improve interoperability?*	*How does interoperability enable new systems?*	*What is the value of interoperability?*
Measure of Success	**Component performance**	**System performance**	**System effectiveness**
Experiment Design Criteria	How will the technology facilitate integration across systems and domains to address capability gaps?	What are the interoperability or OA implementation issues to be examined?	What warfighting improvements will be measured in this experiment?

Identifying technical goals will lead to actionable experiment design criteria

Domains' Criteria	**Component Technologies**	**Integration Challenges**	
Is it OA? **Is it Fn?** **Is it feasible?** **Is it relevant?**	IPv6 QoS Security Sys Mgmt Policy Timing Look-up Services Dynamic Resource Mgmt	Joint Track Manager UDOP/COTP Real-Time Fusion Engine Common Data Model	**Military utility helps compare cost and performance for new systems**

Enterprise Overview of Prime Integrators and Contracts



Example Contract Language – Section C

1. **Open Architecture** – Incorporates portability, maintainability, interoperability, upgradeability, transportability, and long-term supportability. Modular and layered. Maximize COTS/NDI hardware, operating systems, and middleware.

2. **Open Modular Design** – Modules shall consist of components that are self-contained elements with well-defined interfaces. Contractors will provide the rationale for the modularization choices made to generate the design and shall explicitly address any tradeoffs performed, particularly those that compromise the modular and open nature of the system. Designs shall be documented and modeled using industry standard formats and tools that can expert information in a standard format.

3. **Interface Design and Management** – Clearly define the component and system interfaces. Define and document all subsystem and configuration item level interfaces to provide full functional, physical, and electrical specifications.

4. **Treatment of Proprietary Elements** – Identify and justify the use of proprietary or closed interfaces, code modules, hardware, firmware or software. For those portions of interfaces, hardware, firmware or modules that are proprietary, the Contractor shall employ hardware and/or software partitioning or other design techniques to isolate the proprietary portions from the rest of the system. It is the contractor's responsibility to protect the open elements of the system from being intertwined with the proprietary elements.

Example Contract Language - Section C

5. **Open Business Practices**. The Contractor shall demonstrate that the modularity of the system design promotes the identification of multiple sources of supply and/or repair, and supports flexible business strategies that enhance subcontractor competition. The contractor shall identify any known alternatives for solutions the Contractor has proposed to custom build. The contractor shall identify those pre-existing items it intends to reuse. If the Government has identified a component or components that can be reused in the system design, the Contractor must justify (by cost, schedule, compatibility, etc.) any exceptions to this proposed reuse to the Government's satisfaction. The general objective of these efforts shall be the development of common system and/or common elements or components which meet the performance requirements of the various U.S. Navy platform missions, where commonality offers the greatest cost and technical benefits.

6. **Peer Review Rights**. The government intends to procure open architectures, designs, and corresponding software components. For designs or software the Government has GPR, the Government intends to receive third party reviews on an ongoing basis. Proprietary elements, that the Government has approved into open designs and code, will not be subject to this review.

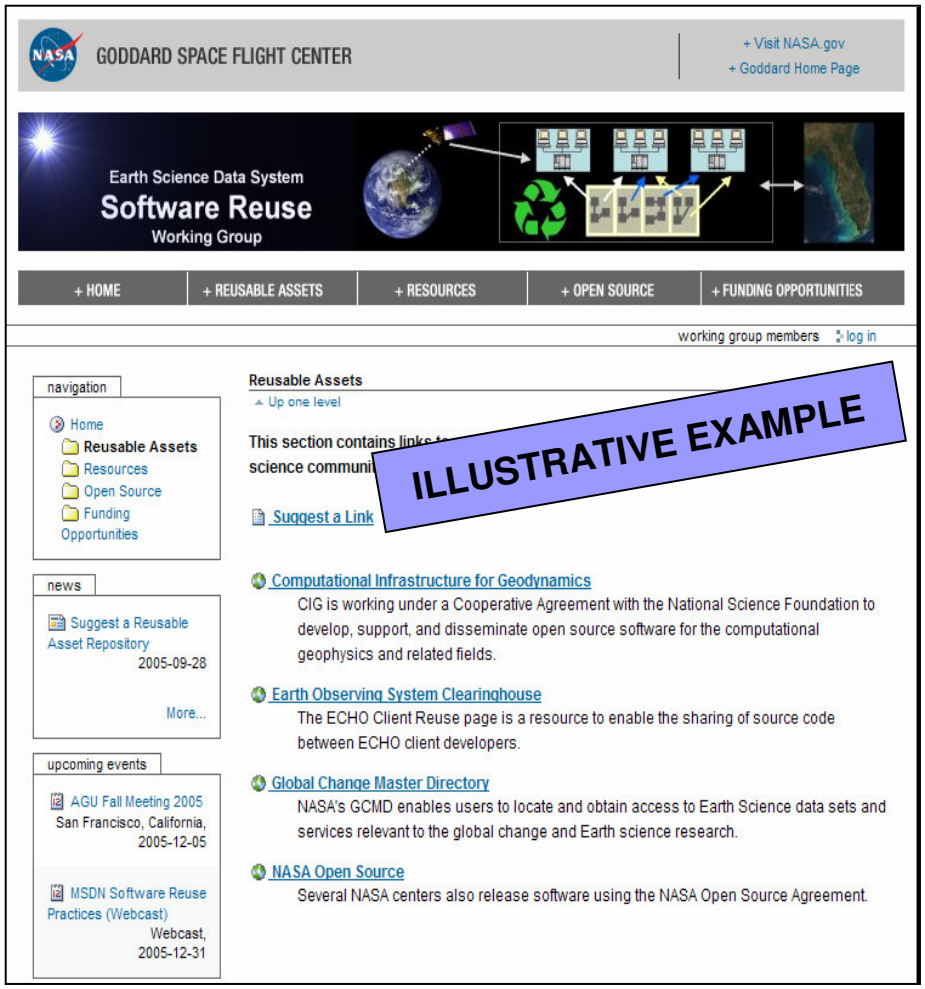
Example Contract Language - Section C

7. **Technical Insertion Method** - The Contractor's architectural approach shall provide a viable technology insertion and refresh process.

8. In accomplishing the above, the Contractor shall use the following standards in descending order of importance:

   - Standards as specified within the contract
   - Commercial standards
   - Standards that are developed by international or national industry standards bodies that have been widely adopted by industry
   - Standards that are adopted by industry consensus-based standard bodies and have been widely adopted in the market place
   - De facto standards (those widely adopted & supported in the market place)
   - Standards that are not specified within this contract must be approved by the Government prior to use

Enterprise Component Library



Purpose

- Establish a Naval Enterprise OA Software Re-Use Library
- Establish configuration management processes and business rules to maintain the library