

Naval Open Architecture

Navy League Council Meeting



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The Navy must build a fleet where mission systems...



Proprietary solutions are no longer in vogue...we're going to switch the money around and we're not going to have stand-alone applications with server farms on carriers and [destroyers]

- Vice Adm. Mark Edwards, Deputy Chief of Naval Operations for Communications Networks, Defensenews, 09 Apr 07



... are modular, interoperable, and affordable to upgrade



Adopting Open Architectures will help reach this goal...

Naval Open Architecture is the confluence of business and technical practices yielding modular, interoperable systems that adhere to open standards with published interfaces. This approach increases opportunities for innovation and competition, enables reuse of components, facilitates rapid technology insertion, and reduces maintenance constraints. Naval Open Architecture delivers increased warfighting capabilities in a shorter time-to-field at reduced costs.

OA CORE PRINCIPLES

Modular design and design disclosure

Reusable application software

Interoperable joint warfighting applications and secure information exchange

Life cycle affordability

Encouraging competition and collaboration

Source: OPNAV Itr Ser N6N7/5U916276 dtd 23 Dec 05



...but requires shifting our acquisition model...

PAST – MILSPEC MODEL

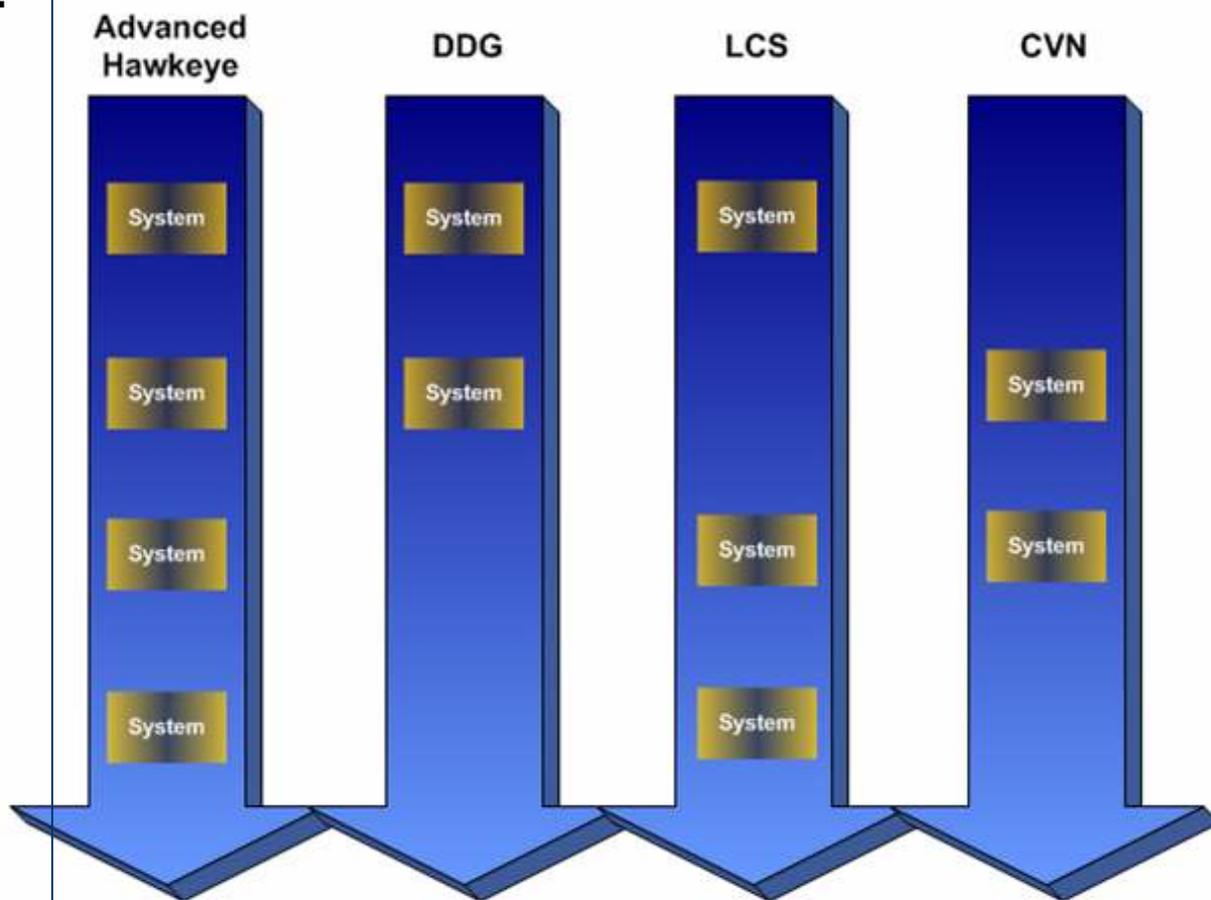
Business Model Attributes:

- Platform Focused
- Owner controls evolution
- Cost emphasis
- Develop software
- Make custom hardware

System Model Attributes:

- Requirements driven
- Specification focus
- Rigid requirements
- Unique / monolithic architectures
- Stable design
- Ignore evolution
- Obsolescence
- Waterfall-style development

Platform-focused model





...to a model that better aligns to capabilities across multiple platforms and families of systems

PRESENT – OA MODEL

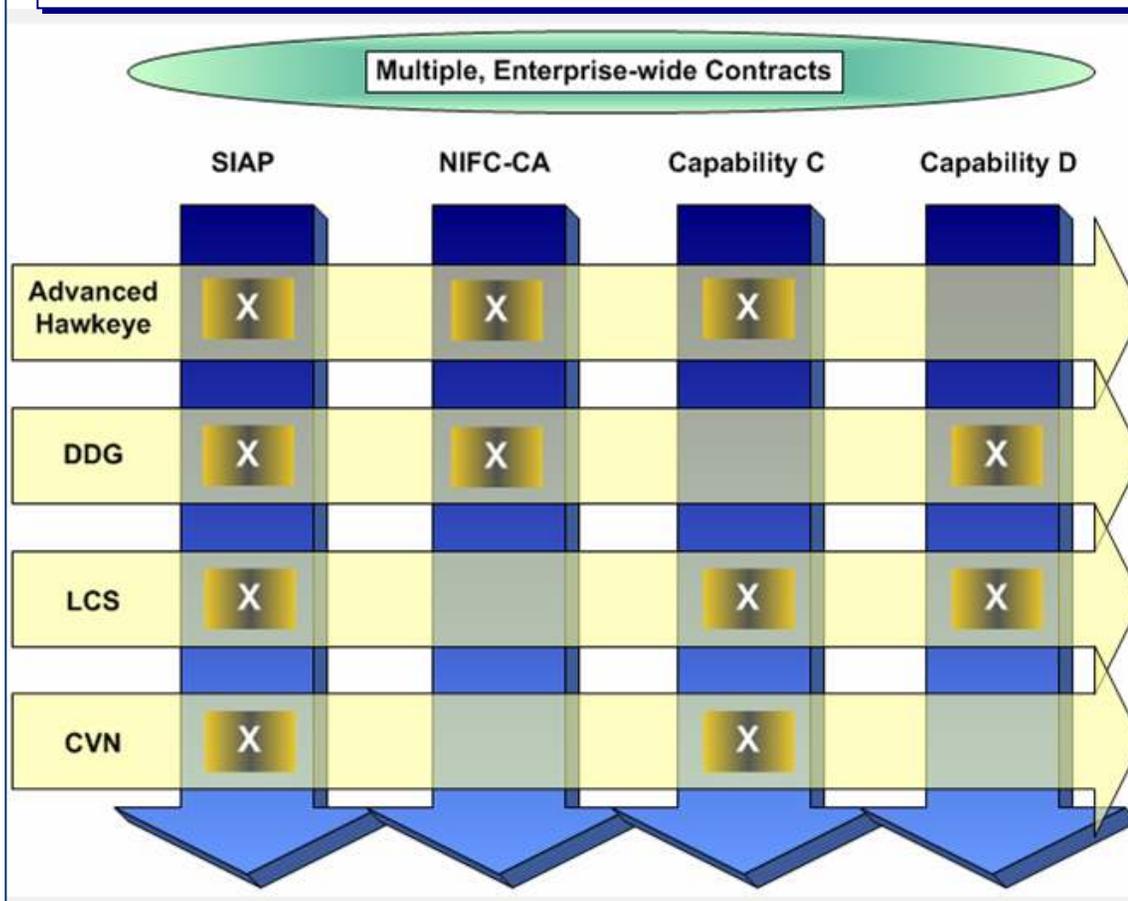
Business Model Attributes:

Capability / Systems Focused
Market controls evolution
Total Ownership Cost emphasis
License or Reuse software
Leverage COTS or Reuse

System Model Attributes:

Market driven
Business plan focus
Flexible requirements
Modular open architectures
Constant changes
Design for tech refresh
Early-managed obsolescence
Spiral development

Capability / System-Based vice Platform-Based



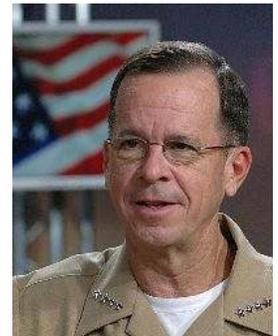


OA is at the forefront of our Naval acquisitions



“It is the Navy’s responsibility to optimize the fleet’s capabilities. Such optimization might include common standards; preferred components and subsystems; mission modularity; and open architecture.” - - Secretary of the Navy, Dr. Donald C. Winter, Sea Air Space Expo, 02 April 2007

“ My vision for OA isn’t limited to systems built to a set of open standards, but rather it is focused on open business models for the acquisition and spiral development of new systems that enable multiple developers to collectively and competitively participate in cost-effective and innovative capability delivery to the Naval enterprise.” - CNO ADM Mullen, Defense Daily ,11 September 2006



“Half the cost of a new ship is in mission systems...OA is one of the real enablers for us to do things in the future and a key to making ships more affordable” - - ASN (RDA) Dr. Etter, Defense News, November 2006



Clear direction has been provided on our future path

OA EXCOMM V



Implement a new business model

Identify changes to T&E

Implement a Peer Review Process

Identify trends beyond OA

Identify new platform acquisition strategies

Identify key decisions in next 12 months

Provide cost comparison on new construction

Incorporate OA language in contracts

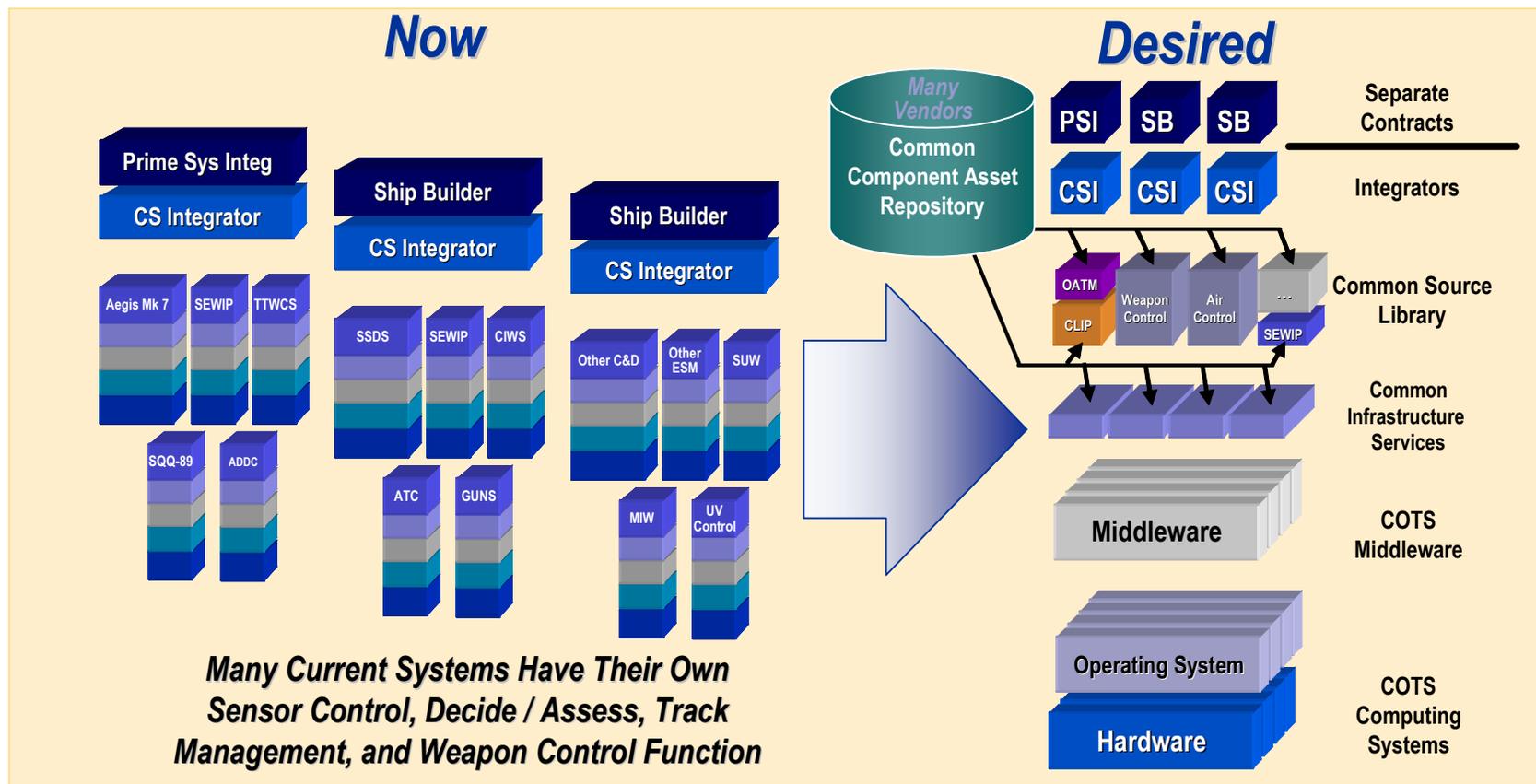
Change business processes

Accelerate OA in Surface Domain



A new model is being developed for combat systems

Surface Combat Systems





Contracts are being changed to include OA requirements



“The goal now is to write open architecture requirements into contracts and provide companies incentives to meet the goals.”

- ASN (RDA), Defense News , 01 November 2006

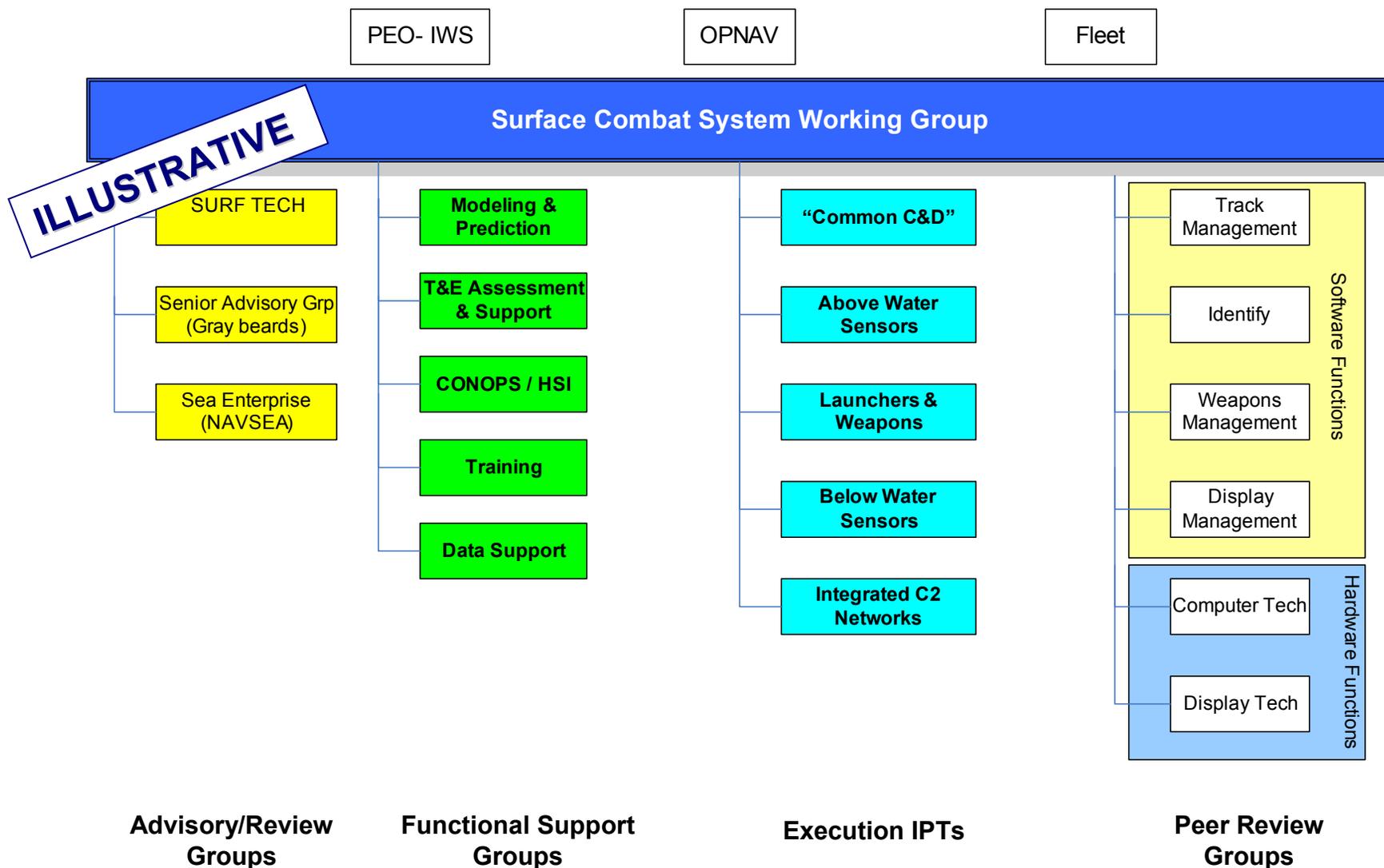
Include OA requirements from Program Managers Contract Guidebook

Strive for Government Purpose Rights (GPR) in contracts to facilitate reuse

Accept restrictive rights only when the business case warrants



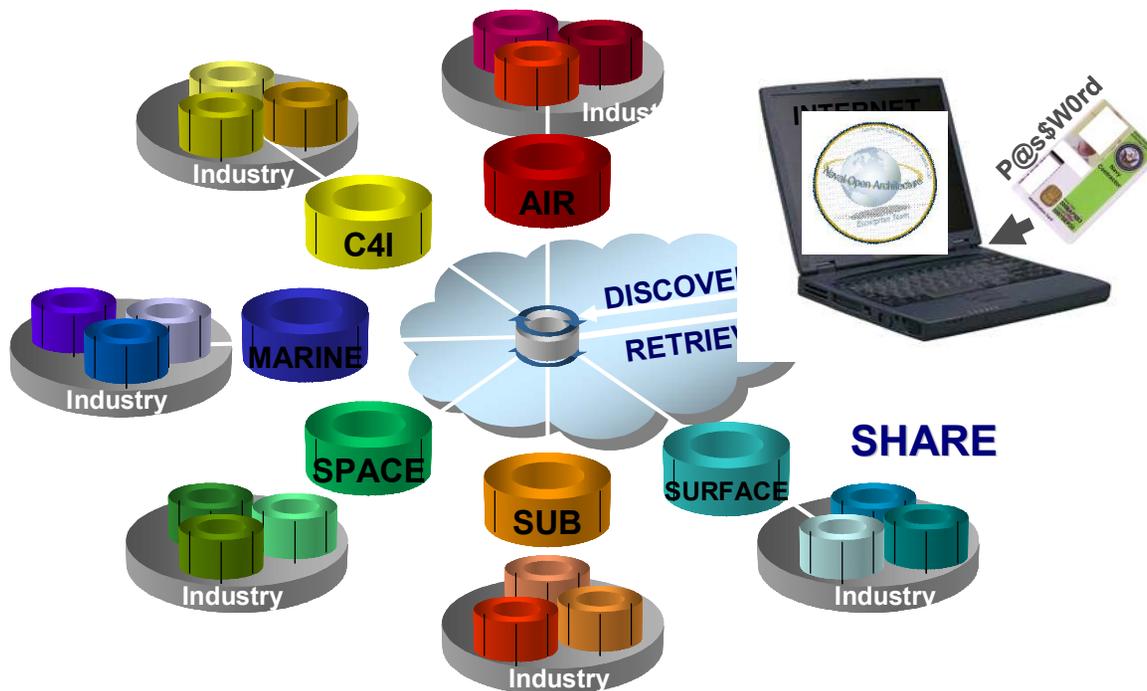
Peer Reviews are being established





Surface assets are being stored in the SHARE repository

End goal is to make gov't assets available via repositories



SHARE METRICS TO DATE (established Aug 06)

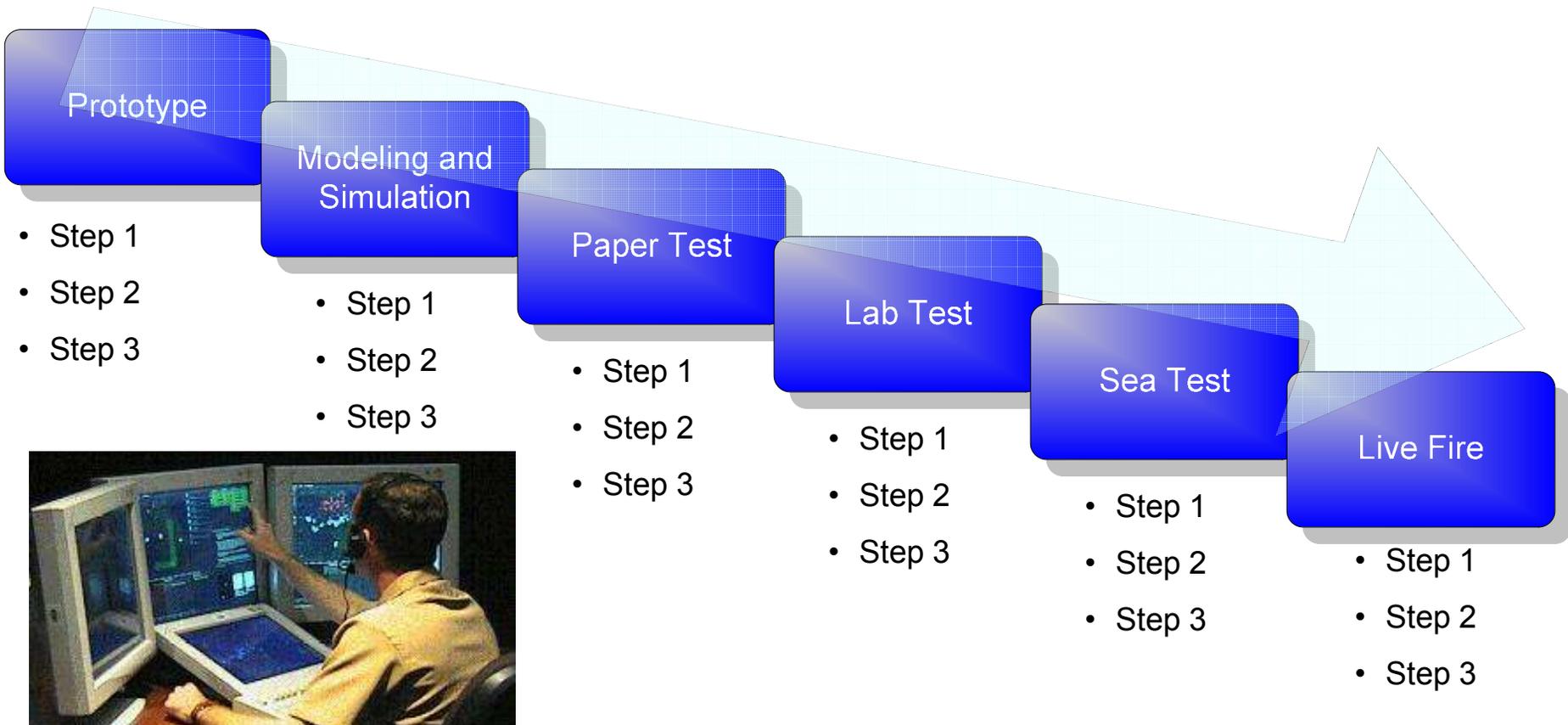
- Total Assets Contributed
 - 46 design documents
 - 5 application toolsets
 - 9 code assets
 - 1 data model
- 96 Registered Users
- 197 Requests for Assets
- 3.25 million lines of code

"We're giving [the Navy] the whole system, from soup to nuts... This is the first time we're turning over the whole system, the whole data model, where in the past we've seen portions or parts thereof."

- Kendell Pease, a General Dynamics spokesman, 05 January 2007



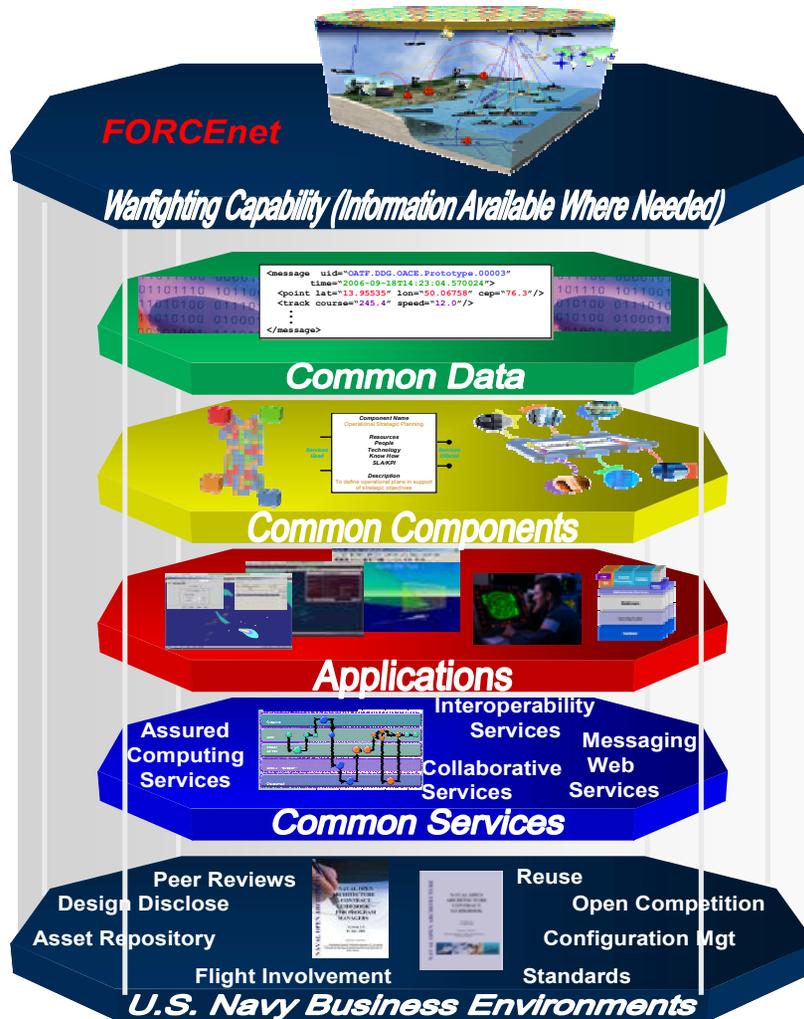
Changes to T&E processes are being evaluated



Risk based testing – determining which steps can be eliminated in the process



Solutions are being tested in the OA / FORCEnet experimentation collaborative environment...

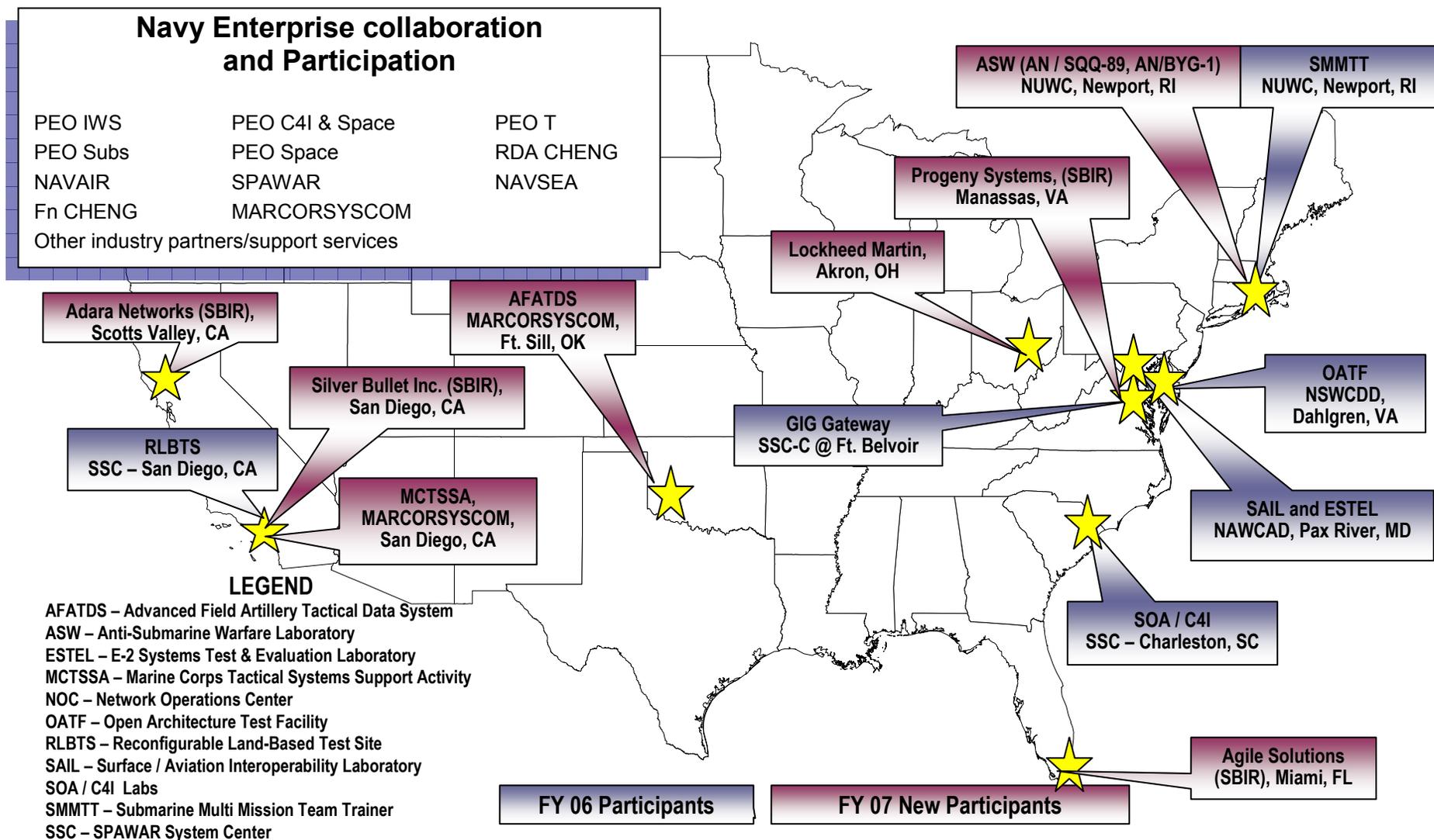


OA / FORCEnet Experimentation Vision

Prototype Open Architecture business and technical practices in a collaborative Naval enterprise environment to facilitate rapid integration of components across systems and platforms for delivery of interoperable warfighting capabilities at reduced costs

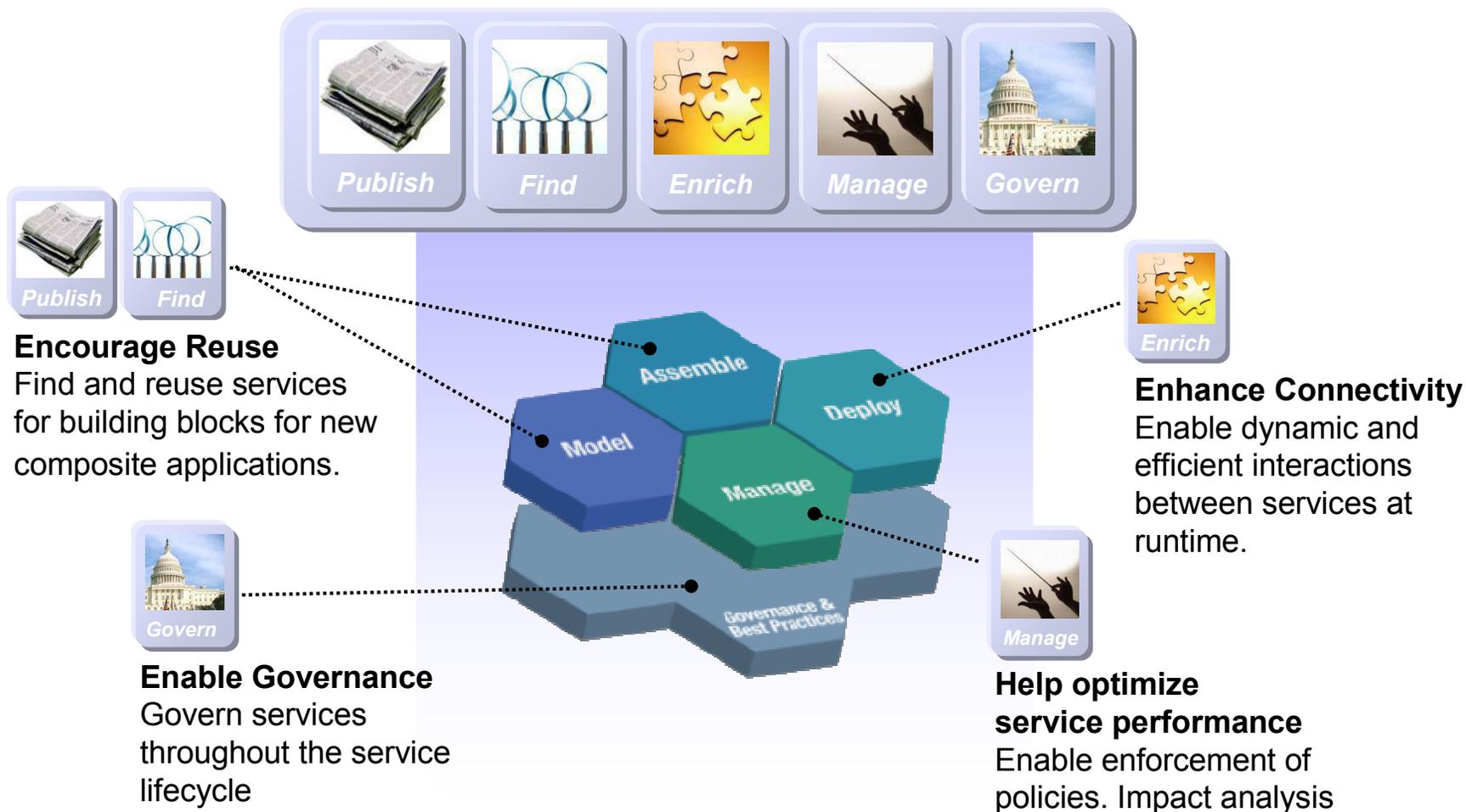


...which links many government and industry sites





Beyond OA, we are beginning to understand new approaches to building solutions - SOA





We do not know what the future holds but we do know that insight which will prevail over many years is a challenge



Although many leaders have been successful, some of their predictions have been proven wrong!

“I think there is a world market for maybe five computers.”

Thomas Watson, chairman of IBM, 1943

Even if a submarine should work by a miracle, it will never be used. No country in this world would ever use such a vicious and petty form of warfare!” - William Henderson, British admiral(1914)

“Computers in the future may weigh no more than 1.5 tons. ”

Popular Mechanics, 1949

Another popular fallacy is to suppose that flying machines could be used to drop dynamite on an enemy in time of war. -

William H. Pickering, 'Aeronautics,' 1908

“640K ought to be enough for anybody. ” Bill Gates, 1981



We must be able to react to trends that impact how we build systems today and in the future

DEFENSE LANDSCAPE

- **Net-centric warfare** requires greater information superiority
- A **1,000-ship Navy** requires a global maritime network of sharing
- The **Global War on Terror** and new emerging threats will shift priorities in the Defense budget

TECHNOLOGY LANDSCAPE

- **Open standards and systems** will surpass closed proprietary systems
- **Service Oriented Architectures** will create new business models that increase competitive pressures on companies
- Exponential rates of advancement in **digital technologies** is facilitating “faster, better, cheaper” production of the global digital infrastructure

BUSINESS LANDSCAPE

- **Intensified competition**, customer expectations, and unexpected market shifts are forcing industry changes
- Traditional approaches to **R&D** will not be sufficient when it comes to fostering and sustaining innovation
- Global connectivity is making new skills and partners accessible to employ which is creating new forms of collaboration and **business models**



*The Navy currently is transitioning to a state of “continuous readiness.” Instead of cyclical preparations before deployments, the Global War on Terrorism requires constant operational capability. “Whether it’s a warfight or a natural disaster—and they seem to be coming more **frequently—we must be much more ready for responding to this very uncertain world than the regimented fashion in the past.**”*

~ Remarks by Adm. Mullen, December 2006
