



PROGRAM EXECUTIVE OFFICE LITTORAL AND MINE WARFARE

Presentation to:

**National Symposium on
Sensor and Data Fusion**

Mr. Victor Gavin, Executive Director

Program Executive Office, Littoral and Mine Warfare

August 05, 2009



PEO LMW Organization

**Maritime Surveillance
Systems**
PMS 485
CAPT J. Ferrer



**Unmanned Maritime
Vehicle Systems**
PMS 403
CAPT P. Siegrist

**Anti-Terrorism/
Force Protection
(Afloat)**
PMS 480
CAPT J. Day



C-IED and EOD
PMS 408
CAPT J. Neagley

**Mine Warfare
Systems**
PMS 495
Ms. D Carson-Jelley



LCS Mission Packages
PMS 420
CAPT M. Good

**Naval Special
Warfare**
PMS 340
CAPT P. Sullivan



NECE USE SWE SOCOM

**Delivering Capability to Naval & Joint
Forces to Dominate the Littorals**



PEO LMW Video



What is Naval Open Architecture?

Naval Open Architecture is the confluence of business and technical practices yielding modular, interoperable systems that adhere to open standards with published interfaces.

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



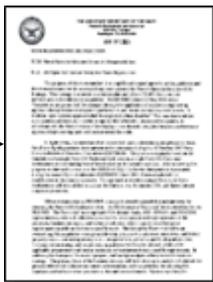
OA Progression Since 2004

Apr 2004 USD (AT&L) issues Modular Open Systems Approach Implementation Memo



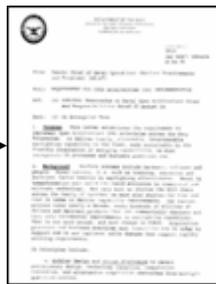
OSD OA Policy

Aug 2004 Navy issues Open Architecture policy



Naval OA Policy

Dec 2005 OPNAV issues OA Requirements



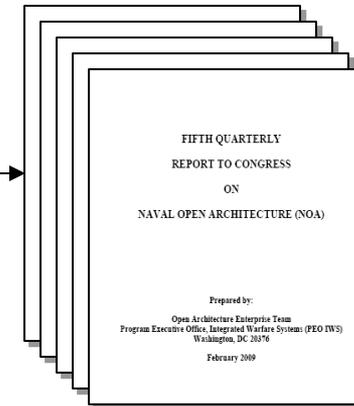
Navy OA Requirements

May 2007 ASN RDA issues Memo to CNO on OA progress



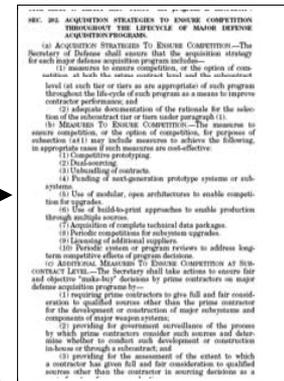
Navy OA Progress

Feb 2008 – Present OA Reports to Congress



Navy OA Reporting

2009 Weapons Systems Acquisition Reform Act



OA in Law

Increased Competition

2004

2009



OA in support of Navy's long-term goals



"[T]he use of Open Architecture precepts as the basis for achieving our stated goals is **critical to the long term needs of the Navy Enterprise.**"

--ASN(RD&A) John J. Young Jr.
Aug 2004

"We're working to **increase competition** from the prime down through the subcontractors... We are **pursuing open architecture**, which promises to arm us with a powerful cost-avoidance tool, as well as a process for improving warfighting capability."

--16 Jun 09, Testimony to Subcommittee On Seapower, Committee On Armed Services



"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 Mike Mullen, Sept 2006

"[O]ur shipbuilding plans **incorporate open architecture** for hardware and software systems and increasingly use system modularity. These initiatives **reduce costs** from inception to decommissioning and allow **ease of modernization** in response to evolving threats."

--CNO ADM Gary Roughead, June 2009



2004

2005

2006

2007

2008

2009



Progress across the Enterprise



Marine Air Ground Task Force Command and Control - reuse 8 components from other programs to reduce costs



LCS Mission Modules - Mission Package Support Container based on inter-modal shipping standards, well-defined common interfaces, organic inheritable existing services and modular architectures



Submarine Warfare Federated Tactical System -reduced cost per boat per year by \$2.9 million, saving hundreds of millions of dollars.



Mobile User Objective System Common Air Interface Waveform based on a Global Commercial Standard used for cellular phones – 85% reused or modified software



Common Processing System -designed around commercially available hardware and software and will provide computer processing, memory, data storage and extraction and I/O interfaces to support host software applications



P-8A - 30% of \$261M award fee pool tied to technical criteria; MOSA 1 of 10 technical criteria. Reuse 68% of mission software, over 2.5M SLOC



Migration to **CANES** reduces 4 shipboard networks to one. A notional carrier configuration for CANES Inc. 1 environment is expected to save \$4M (13%) per ship.



OA in Smartphone Market

"The sum total of open source developers across the globe is fairly staggering. Imagine having that collective whole working to create interesting, helpful applications, as well as bettering the total experience with the phone. That future is what awaits the smartphone based on open source technology."

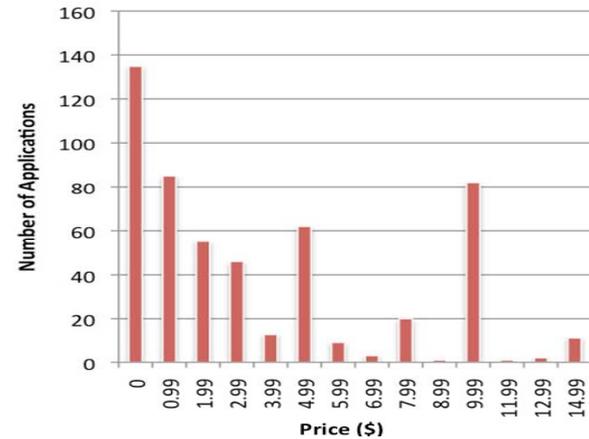
—ZDNet

"... new startups answer the call for emerging markets ..."

—Google News Service



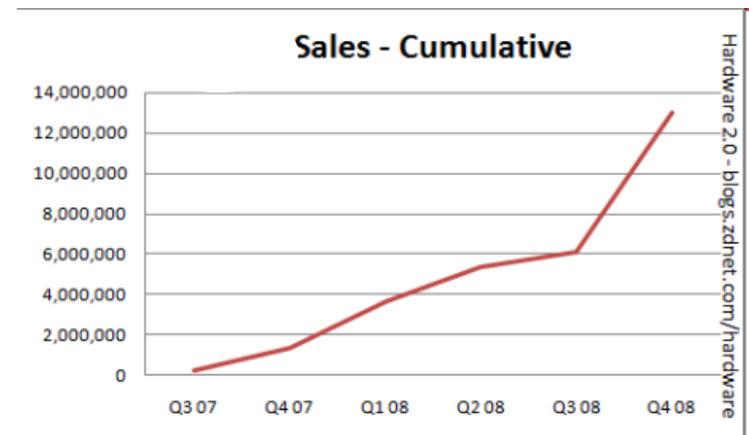
If apps are cheap to develop, more can be developed and they can be sold at low costs



Cheaper and more plentiful apps, translates into more sales of apps



Cheaper and more plentiful apps puts smartphones in higher demand than other phones





How do smartphone manufacturers drive innovation?

1 Established a development center on the web

Smartphone Development Center:

- Technical Documentation
 - Getting Started Documents
 - Reference Library
- Featured Content
 - Programming Guide
 - Development Guide
 - Interface Guidelines
- Readiness Checklist

2 ... with explanations of how to develop secure apps, use graphics & animation, improve performance, and manage data ...

Getting Started:

- Getting started with Security
- Getting started with Graphics and Animation
- Getting started with the User Experience
- Getting started with Performance
- Getting started with Tools
- Getting started with Data Management

3 ... and tutorials on how to develop apps

The runaway success of “apps” for smartphones demonstrates the power of establishing an open development environment



Laying the groundwork to drive innovation in LCS

PMS 501

1 Separate Platform from Capability



PMS 420

2 Build Common Computing Environment & Vehicle Comms

1 Mission Package Computing Environment - MPCE



1 Multi Vehicle Communications System - MVCS



3 Componentize mission modules to provide 3 interchangeable capabilities



Mine Warfare



Anti-Submarine Warfare



Surface Warfare





Openness is essential in 21st Century

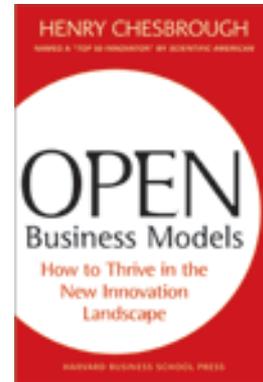


Open source harnesses the power of distributed peer review and transparency of process. The promise of open source is better quality, higher reliability, more flexibility, lower cost, and an end to predatory vendor lock-in.

Open Business Models

“Open business models foster collaboration with customers and suppliers to everyone's benefit. Innovation in the business model is one of the most profound ways to differentiate a business and turn the tables on competition. Organizations that keep their IP too close to the vest risk missing out on critical innovations.” ~ Henry Chesbrough

Chesbrough



Open Innovation

“Open innovation is the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively.” ~

<http://www.openinnovation.net>



Closing Remarks and Questions