Open Technology Development & Testing

John Scott
OSD, AS&C Consultant
240.401.6574,
johnmscott@mindspring.com
Network-Centric Systems

- Can’t create new systems with old tools/processes
- Current methods of acquisition are good when purchasing static componentry
- Not so good at acquiring systems which need to be modular, networked, dynamic, open to unknowable future concepts of operation.

*Fostering/enabling innovation is central to network-centric warfare*
INCREASE TRANSACTION RATES*

• “The future is here. It’s just not evenly distributed.” - William Gibson

• “If you want to succeed, double your failure rate” - Thomas Watson, Founder IBM

* Col. John Boyd
Problem 1: Current Acquisitions System

- Requirements and acquisitions process takes too long
- Needs in the field aren’t being addressed in time to have impact
- Cost estimates for major weapons systems continually increasing
- Systems tend to be used to get-the-job done versus by-the-book
Problem 2: Rapidly Changing Threats

Opponents able to plan around our current and future planned strengths and capabilities

Implications:
Capabilities built to meet a moving target
- Red Queen Scenario, enemy evolving with us (co-evolution)
- Competitive disadvantage

As the need to react to rapidly changing threats increases so must our tactics, to include design & testing processes
Current Design/Testing Methods

DOD acquisition system ill equipped to rapidly respond to rapidly morphing threats, leading to the creation of new entities to bypass existing acquisitions processes:

- ACTD Program
- Rapid Equipping Force
- Task Forces (IED, etc.)

Why is this not the norm?
Large Acquisitions Programs

Requirements/Design

“MIRACLE”

System

→ The Immaculate Acquisition
‘Fast and the Furious’
UAH Production Acceleration

Up Armored Humvee Production (from General J. Sorenson, presentation to CSIS)

Oct 03    AOR Needs 3279 / Monthly Production 81
First Acceleration Dollars Received

Aug 03    AOR Needs 1407 / Monthly Production 80

May 03    AOR Needs 235 / Monthly Production 15

Jan 04    AOR Needs 4149 / Monthly Production 138

May 04    AOR Needs 4454 / Monthly Production 220

Jul 04    AOR Needs 5000* / Monthly Production 350

Oct 04    AOR Needs 8105* / Monthly Production 450

*Estimated
Deficiencies

• DoD develops and has paid for large amounts of software code that isn’t readily accessible or reusable.

• Interoperability issues across the services, commands and systems.

• Services constantly reinventing code

• Increasing complexity of software code

• Development costs outweigh COTS costs (if COTS available)

• Timely delivery of new solutions
How network centric systems are acquired influences behavior

Results:
• Stove-piped systems
• Inoperable systems
• Slow creation of systems, lack of agility
• Less innovation

Basic Premise of Solution
Two areas to change for creating network-centric systems:
1. The environment for how systems are acquired, designed, utilized and shared
2. Methodologies for acquisitions
Change Methods

**Open Technology Development (OTD) methodologies for hardware and software**

DoD has spent huge amounts of money developing software code, which is rarely available for reuse.

- Information technology is the glue
- Open-source proven success in the private sector
- Better systems components are evolved, evaluated and tested through a distributed competitive collaborative network.
OTD Overview

• Transition of publicly available OSS into (and out of) DoD

• Development of DoD enterprise code ‘repository’* for reuse

• Enable collaboration across DoD on technology acquisition and development

*Not centralized
OTD Benefits

- Speed of technology deployment
- Avoid constant rebuilding of technology
- Improve technological collaboration
- Leverage external open source technology investments
- Focus new development in appropriate areas
OTD tools

• Manage the software development lifecycle and enable better documentation of code
• More than just a code repository – community and collaboration tools
• Increased code reliability and reduction of interoperability risks
• Increased awareness about developed code.
• Potential savings though reuse of code
• Breeding ground for new ideas
• Treats code as dynamic and evolving vs. static
Industry Understands the Benefits

- Corporate America is transitioning
- IBM - > $1B Investment in Open Source
- Apple - OSX built on open source
- HP - over 200 Open Source based products
- Microsoft uses open source methods internally
- CSC and BAE - Shifting to OSS Model
OT&E & OTD

• Testing & validation plays a key role in OTD

• Community of interest needed to rapidly test and evaluate new systems and rapidly share test technology

• Dynamic environment needed to match testing needs to IT development

• OT&E is part of a dynamic environment

• Testing of NCW systems must move from static testing to constant dynamic monitoring.
Not just Technology

• Need to focus on fostering the creation of an ecosystem that recognizes (and rewards) risk taking and innovation coupled with open architecture systems.
• Questions?
• For further information contact me for:
• AS&C, Open Technology Design Report
• NUWC report: *Network-Centric Warfare, Total Systems Design & Testing, June 2005.*
• John Scott, johnmuscott@mindspring.com, (240) 401.6574

Effort initiated by: Sue Payton, Deputy Undersecretary of Defense - Advanced Systems & Concepts
References & Additional Information

• Memo: CIO John P. Stenbit SUBJECT: Open Source Software (OSS) in the Department of Defense (DoD), May 28, 2003,


• Open Source Software initiative, http://www.opensource.org


• Raymond, E.S., The Cathedral & the Bazaar: Musings on Linux and Open Source by an Accidental Revolutionary, O’Reilly Publishers, 2001

• Open Source Software Institute (deal with Gov issues), www.oss-institute.org


• Open Source Software for Imagery & Mapping, http://www.ossim.org (great example)