Actions to Enhance the Use of Commercial IT in DoD Systems

Version 3.1

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The Problem

- Information technology (IT) is critical to DoD
  - Accomplishing missions
  - Maintaining technological lead
- Much IT technological innovation occurs outside traditional DoD acquisition process
- ISSUE: How to capture IT capabilities developed outside traditional process for DoD use?

Background: US R&D Funding

Year	DoD ($B)	Commercial ($B)	Total ($B)
1993	64 (38%)	102 (62%)	166
2000	65 (26%)	180 (74%)	245

Expanded Commercial IT

- Innovation (cont.)
  - Top 6 DoD firms to Top 6 Commercial IT firms
    - Patent filing ratio: 1:6
  - R&D software/computer services
    - 1987: $2.4B
    - 2001: $24.5B

Overseas Challenges

- International challenges—pluses/concerns
  - Pluses: US R&D 2000
    - Greater than combined other G-7 (US 54%)
    - 2.7 times Japan
    - 25 times China
  - Concerns
    - Patent share: 1980--60%, 2003--52%
    - Peer reviewed articles: 1983—61%, 2003—29%
    - Science/engineering PhDs: 1989—38%, 2000—31%

Non-alliance Growth

- International challenges
  - Example: CTNSP study of Chinese telecommunications
  - 10-year growth moves from rudimentary to
    - 2d largest fiber optic network
    - Large business communications network
    - Highly developed Voice Over Internet Protocol (VOIP)
    - Large cellular network (both GSM and CDMA)

Shifting IT Market

- Commercial IT is not a static, “forever the same” resource
- Significant trends are growing/driving commercial IT off-shore
- Reliability of foreign off-shore to DoD requirements is uncertain

DoD Non-Dominant Player

- DoD Market Impact
  - "DoD is unable to acquire intellectual property (IP) rights for commercially developed technology, as it has done for defense-funded technologies in the past, because DoD's financial involvement will be limited and its demand is not dominant compared with the worldwide commercial market"
  - Manager's Guide to Technology Transfers in an Evolutionary Acquisition Environment, Jan. 31, 2003,p.1-16

DoD Non-Attractive Market (1 of 2)

- DoD Market Attractiveness --CTNSP survey — Top reasons for not doing business with DoD
  - Don’t know what they want
  - Application/bid process too long
  - DoD only deals with large companies
  - Our products not needed by DoD
  - We do not want to work with DoD
  - Too many barriers to the bid process

DoD Non-Attractive Market (2 of 2)

- DoD Market Attractiveness
  - Non-traditional firms are reluctant to enter the defense market . . . because of
    - IP issues
    - Long product development times
    - Cost accounting, auditing, and oversight requirements
      - Manager's Guide, at pp. 1-18, 1-20 (check)

DoD Non-Transparent Market

- DoD Market Attractiveness - CTNSP survey: Current DoD contractors concerns
  - Process too difficult, too slow, too confusing
  - Increase information available to small business
  - Lack of opportunity for firms that have not won prior contract
  - Ease security clearance process
  - It is an exclusionary process
  - Lack of clear information about government contracting

DoD Non-Agile Market

- DoD Market Attractiveness
  - DoD's budgetary arrangements usually require that transitions [of technology] be predicted 18 to 24 months in advance
  - The [program manager] community cannot always predict the pace of innovation two years in advance, and funding may not be available for fast-moving projects that are ready for transition
  - A desirable S&T project may stall for 18 to 24 months, awaiting funding. This gap is sometimes called the "valley of death." [Manager's guide, --, 4-22]

DoD Non-Reach-out Market

- Prime Contractor/LSI Issues
  - "Prime contractors may have a natural tendency to prefer internal technology because they can see the design and make it work. Prime contractors may have conflicting objectives about adopting technology from an outsider provider, ranging from something as intangible as the 'not invented here' syndrome to more tangible issues, such as displacing the prime contractor's revenue base. Primes may also be concerned about complex issues, such as problems with the timeliness and compatibility of technologies built by outside organizations."

(Manager's Guide, p.4-37)

DoD Isolating Market

- Requirements Gap
  - Historically, DoD requirements—which are battlefield oriented—demand capabilities not found in commercial sector

Contrasting DoD Needs and Commercial Capabilities

- In the Information System Technology (IST) Technology Area Review & Assessment (TARA), the leaders of each S&T sub-area identified and contrasted DoD needs and the capabilities offered by commercial systems
- A specific example of that comparison is provided for Communications & Networking

Communications & Networking Comparison

Factor	Commercial	Tactical Military
Mobile Subscriber	Fixed	Mobile
Infrastructure Networks	Preconfigured	Ad hoc, self organizing
Antenna Towers	Tall, Fixed	Small, easily erectable
Frequency Spectrum Availability	Greater	Restricted (geographically impacted)
Protection	None to privacy	None to TS/SI
LPD, AJ	Not an issue	Critical

Source: 2004 TARA

Current DoD Approach (1 of 5)

- DoD has recognized the problem
  - 29 June 94, SecDef
    - DoD "must increase access to commercial state-of-the-art technology"
  - 5 Sep 2000, USD(AT&L)
    - "technologies that shape the economy are largely funded by commercial industry"
  - 12 May 2003, DoD Instruction 5000.2
    - "make maximum use of commercial off-the-shelf technology"

Current DoD Approach (2 of 5)

- Information Technology
  - 23 June 2000—DoD Dir. 8190.2, Electronic Business/Electronic Commerce: “Use commercial EB/EC standards and commercial-off-the-shelf (COTS) solutions to the maximum extent practicable”
  - 27 Feb 2002--DoD Dir. 8000.1, Information Resources/Information Technology: “Take maximum advantage of COTS.” “Commercial or NDI shall be used as much as possible . . . .”
  - 25 June 2004—ASD(NII): “accelerating the use of commercial IT software and services in DoD IT portfolios is one of my highest priorities.”

Current DoD Approach (3 of 5)

- 8 Apr 2003: Approval of COTS Information Technology/National Security Systems Software Action Plan
- Purpose: accelerating the use of COTS within Net-Centric initiatives to further Transformation

Current DoD Approach (4 of 5)

- Legal Baseline
  - Statutes
    - Cohen-Clinger — maximum use of commercial IT
    - OTA — flexibility for prototypes, research, grants, cooperative activity
  - FAR/DFAR
    - FAR Pt 12 -- commercial acquisition
    - FAR Pt 39 -- IT acquisition

Current DoD Approach (5 of 5)

- Guidelines
  - Intellectual Property: Navigating Through Commercial Waters (AT&L 2001): "guide . . . for the Government . . .and . . . industry . . .with new ideas and solutions to address the IP issues"
  - Commercial Item Handbook (AT&L 2001)
  - Manager's Guide to Technology Transition in an Evolutionary Acquisition Environment (AT&L 2003): provides information on requirements, financial, S&T, acquisition and related issues

DoD Methods to Capture Commercial Technology (1 of 4)

- "Business as usual"
  - RFPs
  - IR&D
  - Pilot programs
  - Initiatives by PEOs—direct use/finding of commercial technlogy
- Websites/Bulletin Boards--multiplicity
- OIPTs/IPTs
- Special initiatives (e.g., Rapid Acquisition Initiative - NetCentric (RAI-NC))

DoD Methods to Capture Commercial Technology (2 of 4)

- Small Business Innovation Research (SBIR); Small Business Technology Transfer (STTR; Fast Track)
- Venture Capital-related initiatives; e.g.,
  - CIA's In-Q-Tel
  - Rosettex
  - OSD's Defense Venture Catalyst Initiative (DeVenCI)
  - Army's OnPoint
  - Navy's Commercial Technology Transition Office (CTTO)
  - SOCOM's Arrowhead
- CRADAs
- ACTDs
- Service-sponsored institutes (e.g., Army's Institute for Creative Technologies (ICT))

DoD Methods To Capture Commercial Technology (3 of 4)

- Command/Agency Initiatives
  - Joint Warfare Information Demonstration (JWID)
  - Enterprise Software Initiative—joint software acquisition
  - Enterprise Integration Toolkit—acquire/manage COTS business system
  - DTIC web site/resources
  - DAU courses/Community of Practice website

DoD Methods To Capture Commercial Technology (4 of 4)

- Some Key Players
  - DUSD (Advanced Systems & Concepts)
  - DARPA—funding/development of innovative technology
  - NII
  - Army Rapid Equipping of the Force (REF)
  - Defense Laboratories
    - CTNSP study: “hard to imagine any industrial or academic IT organization of any significance that does not interact with the DoD IT laboratories”

DoD Concerns (re: Commercial IT)

- Integration
- Reliability
- Sustainability
- Assurance

Operational, Geographic Perspectives

- Operational/Geographical:

Engagement/ Business Enterprise | HLS | CT | Post-Conflict | MTW

CONUS ⟷ Reachback ⟷ Operational Theater | Tactical Environment

⟵ Distributed Warfare ⟶

Commercial information technology products
• Ease of adoption/adaptation

(More) ⟷ (Less)

Integration Concerns

- Integration issues vary across operational spectrum
  - Requirements may be affected by availability in commercial marketplace
  - Testing: what reliance on commercial provider
    - unit testing v. system testing v. operational testing
  - Costs, benefits, risks of “wrappers,” “bridges,” “glueware”
- Global Information Grid (GIG)
  - Framework concept
  - GIG Enterprise Services

Reliability Concerns

- Market reliability often less than DoD requirement
  - What benefits justify decreased reliability?
  - Can commercial IT provide reliability for DoD
    - If DoD asks early?
    - At what cost?

Sustainability Concerns

- System maintenance critical to DoD
  - impact of quick change in systems
    - on costs
    - on effectiveness
- Is the right approach assuring long-term availability?
  - Or does DoD need to generate quicker turnover, at least in some parts of the operational spectrum?

Assurance Concerns

- Generally, DoD not address well software risks
- Ongoing Software Assurance Initiative
- FY 2004 Defense Authorization Report:
  - "The conferees support the use of commercial off-the-shelf (COTS) software, but believe the Department of Defense (DoD) must ensure that the recent emphasis on procurement of COTS software will not open vulnerabilities in sensitive DoD command, communications and intelligence software."

Methods To Enhance Commercial IT Capture

- Process/System changes
- Requirements changes
- Acquire available “Low Hanging Fruit”

Proposed Changes to Enhance Capture (1 of 11)

- Enhance Communications
  - Conduct more focused searches
    - Create Techfinders (e.g., build on the ONR-Europe model)
    - Expand the use of Venture Capital approaches
      - Technology brokers (e.g., OSD's Defense Venture Catalyst Initiative (DeVenCI))
      - Non-profit venture funds (e.g., CIA's In-Q-Tel)
      - R&D contracts vehicles (e.g., NGA's Rosettex)
  - Enhance communications with the commercial sector; e.g.,
    - Establish Acquisition Net (ACQUINET)
      - Multilayered portal—connect DoD-DoD and industry-DoD
    - Coordinate tech fairs
  - Provide "acquisition guides" to small companies

Proposed Changes to Enhance Capture (2 of 11)

- Decrease barriers
  - Reduce acquisition barriers
    - Change DoD rules on Intellectual Property
    - Increase thresholds for simplified acquisition process (e.g., modify FAR)
    - Use Other Transaction Authority (OTA) as norm in IT R&D
    - Make OTA available in procurements

Proposed Changes to Enhance Capture (3 of 11)

- Stimulate cultural change
  - Adopt GAO-recommended best practices to acquire commercial-component business systems
  - Knowledgeable buyers
  - Provide incentives for PEOs, PMs, LSIs to use commercial technology
    - Create performance ratings on ability to transition commercial IT
    - Require LSIs to manage to commercial IT
  - Increase DoD training for commercial IT development/procurement
    - Use DAU—expand commercial IT curricula/Community of Practice

Proposed Changes to Enhance Capture (4 of 11)

- Expand Collaborative Developments
  - Expand “underwriter lab” testbeds (at suitable clearance levels) to support evaluation of candidate products (Measures of Performance)
    - Use DoD and National Laboratories more effectively
  - Expand operational testbeds to evaluate the impact of the technology on mission effectiveness (Measures of Effectiveness)
    - Review/expand battlelabs
    - Create “Cyber-range”

Proposed Changes to Enhance Capture (5 of 11)

- Create new institutions
  - Champion the creation of a Center of Excellence
    - New Joint “Bell Labs” for IT/DoD center with distributed reach to industry/academia
  - Establish collocated laboratories and manufacturing facilities (bringing to together users, R&D staff, and manufacturers)
    - Skunk works

Proposed Changes to Enhance Capture (6 of 11)

- Create new organization to coordinate use of commercial IT
  - Joint Program Office
- Create Web Portal to coordinate use of commercial IT — multi-layered
  - Info to industry
  - DoD collaborative info
    - Testing data
    - Reliability of system
    - Virtual IPTs

Proposed Changes To Enhance Capture (7 of 11)

- Increase resource flexibility
  - Provide COCOMS specific procurement authority
    - NORTHCOM for homeland defense/support homeland security
    - Enhance regional COCOMs—possible JTF procurement group led by JFCOM

Proposed Changes to Enhance Capture (8 of 11)

- Increase resource flexibility (cont.)
  - Create bridging fund to transition from R&D to procurement
  - Create flexible working capital fund for prompt procurements
  - Allow greater reprogramming flexibility

Proposed Changes To Enhance Capture (9 of 11)

- Adapt requirements for particular missions
  - Support to peace operations
    - Create a package of commercial IT available to participants
      - E.g., Expanded CENTRIX
    - Use IT to support DoD tasks that overlap with civilian tasks
  - Support to Homeland Security
    - Use commercial IT with National Guard as a “backbone” network
    - Provide commercial IT packages to State/local
- Common requirements for particular functions; e.g.,
    - Installations HQs, commissaries, hospitals

Proposed Changes To Enhance Capture (10 of 11)

- Low Hanging Fruit
  - Focus on potential commercial IT technology in particular areas
    - Communications & Networking
    - Information Security
    - Modeling & Simulation
    - Knowledge & Information Management
    - Computing & Software Technology
  - Create funds for quick acquisitions

Proposed Changes To Enhance Capture (11 of 11)

- Low Hanging Fruit -- CTNSP study findings
  - Currently available technological products can easily be adopted by users and institutions within DoD
  - Used purposive sampling approach to identify technologies in
    - Assured information infrastructure availability
    - Information retrieval and collection
    - Information visualization and knowledge creation

Workshop Purpose

- Recommend actionable steps
- Use work to date as baseline
  - Workshop leaders will have proposals
  - Propose new ideas
  - Support/modify current proposals

Workshop Process

- 5 Workshops
  - Lists of participants
- Review commercial IT questions from different perspectives
- Workshop co-leaders
  - Give general briefs this morning
  - Working sessions in afternoon/tomorrow morning
- Present/synthesize results tomorrow afternoon