

Common Technology 2002 Conference

Commercial Information Technology for Defense Transformation

5 December 2002

Summary of Main Points

Key Points:

- Defense Transformation is a single DoD wide enterprise comprised of two discernable endeavors being pursued in tandem. One is DoD Corporate Transformation – a major public sector organization transforming old bureaucratic methods into best business practices, many already proven and in use in the private sector. The other is DoD Force Transformation aimed at transforming military doctrine, concepts, structures and systems to achieve force-wide network centric capabilities. Both transformations are made essential by Information Age technologies, new threats and the ubiquity of information.
- There is broad advocacy by industry and wide acceptance among DoD professionals, both civilian and military, that COTS systems provide the baseline for acquisition for Defense Transformation: least costly, most standardized, and easiest to upgrade to latest technologies. That premise creates several policy indicators:
 - When procuring systems, opt for COTS wherever possible and resist temptations to add MILSPEC modifications to requirements – resist MOTS.
 - Accept the notion of adjusting processes to COTS, not vice versa. This is particularly applicable to DoD ‘corporate transformation’ processes such as management systems (e.g., PPBS), logistics, and human resources – processes. These processes have parallels in the private sector for which COTS systems feature ‘best practices.’
 - Military add-on features and ‘packaging’ is OK, but keep core as COTS.
- The larger industry players determine COTS standards. If DoD wants to influence COTS design standards it must become a regular participant with larger companies on integrated project teams and standards setting groups during the R&D phase of emerging technologies.
- There are some down sides to COTS: on-the-shelf means it is available to everyone including adversaries; it will not include defense-specific features in most cases; and unique or leading edge capabilities will not be included. Another down side is that COTS could invert the premise that IT exists to support business processes if preferred DoD processes have to be adapted (perhaps sub-optimized) to conform to available IT applications.
- DoD access to pre-COTS will be limited and primarily through larger companies that have the wherewithal to bring new technologies to market. Industry cautions

that pre-COTS, often first invented in micro-enterprises, are unknowns. Direct adoption could stick DoD with a costly, non-standard and non-upgradeable system if it is not later picked up in the private sector and brought to a wider market.

- Industry consolidation has given a new role to the remaining prime contractors: they provide OSD the necessary visibility and oversight in maintain sufficient critical sub-tier contractors. If a contractor in a critical supply area wins two in a row, the government may have a real responsibility to ensure that other contractors are doing R&D, which would not take much money, in order to maintain competition in that field.
- DoD can speed development of pre-COTS technologies by keeping industry informed of Defense interest in new technologies. DoD can also work with venture capital firms to identify new innovations, though this method will usually not obviate the need to team with a larger industry player to develop and standardize the technology.
- DoD is increasing its investment in business software products and innovative management concepts to improve all its management processes.
- In spite of the emphasis on COTS for IT, DoD will continue to require MILSPEC technologies, most notably for weaponry, sensors and force protection.
- Industry has historically found that technologies developed as military-specific can find a commercial market and become COTS. Both methods will continue to motivate industry.
- DoD and all the Services are implementing enterprise-wide or end-to-end IT solutions (Enterprise Resource Planning systems) across various functions, such as logistics. A key decision point is to define the enterprise. The Navy Marine Corps Intranet (NMCI) is a Service-wide enterprise solution. A DoD-wide military pay system within the broader Personnel/HR function defines a smaller enterprise. At their boundaries, ERPs have to interface with legacy systems: sub-systems, external systems or inter-functional systems. Often the advantages of the investment are diluted until related systems can be upgraded.
- Network Centric Warfighting means interoperable forces. That will be difficult, costly and time consuming both across the Services and with allies. It will require continuous top down emphasis. It can be achieved, however we have a long way to go. Allied interoperability is hampered by US export controls.
- Networked forces will create a common operational picture and robust real time information flows move ‘power to the edge’ where information is most needed. The hierarchical command structure will remain but the flow of information will not parallel it as before. Information will flow peer-to-peer (as well as through the command chain).
- Brakes on transforming the DoD acquisition of IT from commercial developers include issues such as Intellectual Property Rights (IPR), the burdensome government procurement system, and the potential reluctance of Congress to allow greater contracting flexibility along with reduced Congressional oversight.

I. Driver's for Defense Transformation – Perspectives from OSD. Presentations by VADM Arthur Cebrowski, USN (Ret) and Dr. Margaret Myers, Deputy CIO, OSD.

Insights on Defense Transformation

A. Defense Transformation has the strategic objective of creating broad and sustained competitive advantage.

B. At the heart of transformation is an understanding that over time rules change, and in the military field the underlying rules have changed in revolutionary ways in three key contexts that drive Transformation:

- Strategic Context. We are moving from the Industrial Age to the Information Age. In the military it is called Network Centric Warfare; more broadly, it is globalization. Strategic military power no longer comes from ‘the barrel of a gun’ (Mao) but principally from the behavior of networking and from IT - that is new.
- Threat Context. The US now faces additional Threats – asymmetric, increasingly perverse, non-nodal, and non-state. These are the non-deterrable threats.
- Technical Context. Ubiquitous, low cost information technology is behind all other technologies and drives them. IT is available at very low cost everywhere around the world. That lowers the barriers to military competition in key areas.

C. Pre-NCW we invested in IT solutions at the tactical level of war with Service-discreet solutions, i.e., the needs of air or ground, but not linked to each other. Traditional information flows paralleled command channels, which are hierarchical. Information only got “joint” at the combatant command level, and then went back down into other Service realms. Hierarchical flows are slow, introducing latency in the kill chain and forfeiting targeting opportunities. Hierarchical systems are also fragile, joined only at one point (the top). If that point is disrupted information flow stops, there are no alternative links. Our cultural bias is to align information flows to the command structure and to leave the people with the greatest need for information, the front line fighters, the most disadvantaged in getting it fast.

D. We will always have hierarchical command structures, however information structures do not need to follow command lines, and should not. The commercial world has moved to peer-to-peer information flows and ‘power to the edge.’ DoD implements some peer-to-peer communications however it is ad hoc, cobbled together. There is no joint doctrine, training, tactics-techniques-procedures (TTPs) being taught to embed that in our doctrine. Ad hoc arrangements don’t work well right away and people are at risk as we spool up.

E. DoD needs to influence the broader technology base upstream to let them know what technologies might be militarily useful. DoD benefits if we nurture as well as reap technological innovation. A methodology we are exploring is that of venture capital

(VC) investment for ‘technology finders.’ That requires adopting an entrepreneurial mindset within DoD.

DoD Enterprise Networking

F. Defense Transformation’s goal is a Network – to shift from a traditional stovepipe approach of information flows to one characterized by fused information available from anywhere within DoD, without resort to building cross-stovepipe interfaces. We will create a single DoD-wide network from which all users can pull information. The DoD Network will provide both richness and reach. Technology advances allow networks to overcome the classic tradeoff between the quality (richness) of information and its dispersion (reach).

G. Five tenets for getting to Net-Centric Operations include:

- Only Handle Information Once (OHIO) principle.
- Post Information Before Processing – follow the concept of “Task-Post-Process-Use”
- Create Smart Data Pull – through tools like a Google-on-steroids and smart data posting, i.e., the use of data tagging and meta tags
- Collaboration – use of collaborative on-line working/research sessions
- Diverse Network Paths – ensure no single point of failure.

H. DoD is funding three key NCW programs for high leverage investment:

1. GIG Bandwidth expansion initiative – 10 GIG /sec to 90 installations, all fiber optic, optical connections by the end of 2004 for a secure, robust optical network. Some attendees questioned whether 10 GIG/sec would be sufficient bandwidth for future requirements and the conclusion was that DoD would have to continue to push technology.
2. SATCOM – to provide ‘last mile’ links between mobile tactical user and global intelligence services by 2007.
3. Horizontal fusion – tools/means to enable smart pull and smart fusion of data by users. This is an ongoing RDTE program using intelligence funds to resource seven pilot programs with technology transfer potential for other programs.

K. DoD is also developing Net Centric Enterprise Services (NCES) - Management services for the Global Information Grid (GIG).

1. NCES will provide Core Enterprise Services accessible across the network including: messaging, collaboration, storage, security, user assistance and mediation.
2. NCES will define Communities of Interest with unique applications such as logistics, intelligence, personnel and command & control.

3. Dynamic Communities of Interest will be created for particular groups, operations.

Main Points Made During Q&A:

- A new Key Performance Parameter (KKP) will be that every system DoD buys has to be ‘net-ready.’ We will hold firm on this requirement.
- We are moving from applications-centered systems to data-centered systems: rather than securing application or “pipes,” we will secure the data through data tagging or meta tags.

II. International Models for Commercial Technology Insertion - Presentations from the United Kingdom and Sweden

Commercial Information Solutions for UK Defense

A. The UK Defense Fixed Telecommunications Service (DFTS) contract is a successful outsourcing model for jointly managed telecommunication and information services. The DFTS contract put in place a broader, more interoperable communications system across MOD facilities within the UK. The system includes applications, services, equipment, maintenance and continuous upgrades. Related benefits were reduced personnel investments and a system that has few militarily unique standards. This model may have similarities to the Navy-Marine Corps Intranet (NMCI) now being fielded by the US.

B. Unique aspects of the DFTS contract were its huge size (250,000 seats), longevity (10 years), close industry-MOD partnership, shared risk management, continuous service expansion and upgrades, as well as its features of agreed value for money, fee for services and non-deliverable penalties. Replacement of legacy systems took two years. The contract is now in its fifth year. Ten-year (or longer) contracts are common in the UK.

C. DFTS is a performance-based contract with over 500 specific performance criteria. In addition to measurable outputs, customer satisfaction criteria included real outcomes of services. The contractor engaged in regular customer satisfaction surveys gaps in performance were identified and they were able to close gaps between expectations and reality. Industry learned to home in on dissatisfied customers rather than investing time with satisfied customers.

D. One concern was that a single-source contract for ministry-wide IT might not work as well from the end user’s perspective where one-size-fits-all applications can foreclose access to high-end specialized products not included in the contract. MOD UK and industry speakers reported no such problems, noting that end-user views have moved from initial skepticism to appreciation for the system.

Commercial Information Solutions for Swedish Defense

E. The new Swedish national defense concept out to 2020.

1. In December 2001 Sweden approved a new national defense concept based on network centric warfare (NCW). The cornerstone principles are interoperability with NATO and US-led coalitions, battlespace awareness, mission command, decision superiority, dynamic engagement, coalition warfighting, survivability, and optimized logistics.
2. The new concept looks out to 2020 because by then all current systems will be retired and there is an opportunity to establish modern principles along with future investments. In 2010 new equipment and methodologies will begin to arrive and operationalize the concept, a ten-year process. 2002 to 2010 will be a testbed period for technologies, methodologies, organizational design, and personnel requirements, and the technologies testbeds have already begun.
3. Integrated industry - MOD project teams working on technological development are beginning Phase II aimed at an operational demonstration in 2005 involving a joint force common operational picture. Subsequent demonstrations will focus on mission command and control, on interoperability and other capabilities.

F. Swedish views on commercial-off-the-shelf (COTS) systems

1. Five years from now there will be little militarily unique communications equipment except, perhaps, for the 'last tactical mile.' Otherwise civilian equipment will be good enough.
2. Large companies are driving universal telephony standards for third generation (G3) mobile telephony systems, the merger of mobile telephony and the Internet. G3 will be an enabler of situational awareness by providing access to a common operational picture for many users via the Net, more or less in real time. G3 technology is already very fast and will get faster in the future.
3. The civilian wireless technology community understands the need for information security. Already there is double-sided authentication between users and networks. A network and a terminal can negotiate single use algorithms for data security. Within two years, civilian standards will incorporate end-to-end crypto.
4. The largest industry players set standards, a broader number of suppliers then produce to those standards and compete for contracts. Upgrading standards is a continuous process and requires international industrial cooperation. As soon as large corporations release new standards they become widely available to the market. Ultimately, a few key suppliers tend to develop long-term relationships with customers by offering the latest technologies available.
5. The military prefers MOTS to COTS because of the desire to control who has the technology they are using, the need to manage the risk involved in using a given system

or technology: if we use COTS what risks are we taking and what advantages do we get? The way forward is to use COTS communications systems ‘as is.’ Buy complete COTS modules and add extra features (e.g., ruggedization) to ‘wrap it in green,’ but do not modify core COTS standards and interfaces.

6. The military can get interoperability and access to the latest technology if it embraces industrial models, upgrades its systems in synchronization with the market, and engages in close relationships with selected suppliers, as the British and Swedish models. In short, behave as a commercial customer. The military should participate in industrial standardization bodies to help them understand military requirements. That way the military will get continuous technology evolution at affordable prices while military R&D funding is directed to military-specific investments. The price to be paid is to give up direct control of life cycles, manage risks differently, and engage in international standardization work.

7. On the down side, the COTS concept biases procurement toward technologies available to any adversary, as opposed to seeking capabilities that go beyond what is mass-marketed. Pre-COTS can be at cross-purposes with a ‘buy COTS’ strategy because such technology risks not become standardized. Industry’s advice is to develop close relationships with large companies, and to participate in both standards development and industry R&D programs to help guide major players toward military requirements.

III. DoD Models for Commercial Technology Insertion – Presentations by the Navy, Army and Air Force.

A. Three themes were discerned from the Service presentations. One theme was major innovations in the acquisition of both systems and services through the use of information-based management processes. Another theme was contracting out many functions that in the past were done in-house such as depot work. A third theme was a growing preference for performance-based contract awards for the procurement of services.

B. NAVAIR Presentation - Performance-based Logistics (PBL)

1. The Navy demand for PBL grew out of the challenges of aging systems, declining parts inventories and rising cost of ownership. Business as usual wasn’t working and we needed to incentivize reliability not repair frequency. PBL was the answer for NAVAIR as it focuses on buying performance – on results and outcomes versus resources. For example: buying ‘time on wing’ versus repairs, aircraft availability versus parts availability, and managing suppliers not supplies. The Navy sought to leverage best business practices as it increased supplier responsibilities, ultimately procuring a better performance end-state, but not directing the how-to from a centralized, organic system.

2. QDR 2001 called on the Services to compress the supply chain to improve readiness. In addition, DPG 03-07 identifies schedule for implementing PBL for all new weapons systems and major fielded systems, tying contractor profits to performance. Fixed price

contracts provide incentive for fewer, smarter repairs, and commitments on availability and reliability. Also, contractors were authorized to design solutions and insert some new technologies without traditional time consuming review processes. Ultimately that means greater profit for the contractor. Challenges were budget reform, Navy cultural change and carefully building a public-private partnership. The main point is that by effectively teaming with industry you can create win-win logistic support

C. Commercial Information Solution for the Army

1. Army investment in commercial IT targets a multi-billion dollar program to reduce legacy IT systems and move to a common, integrated IT infrastructure. The Army IT acquisition strategy is to put networked communications and information systems in place, including web-accessible mobile systems, which can continue to ride the wave of technological innovation and modernization, and not invest in systems that cannot be easily upgraded. These networks will comprise the Army's version of NMCI – within the Army and linked DoD wide, government-wide and nationwide for homeland defense.
2. Enterprise Resource Planning (ERP) is a business management concept founded on end-to-end solutions, the kind the Army has in mind for its IT requirements. The initiative covers systems from the forward tactical to the strategic reach back to posts, camps and stations, including satellite programs and joint programs. The challenge is adapting the ERP concept within the structure of the Army. You have to change the culture and change the process of the Army, change its philosophy on how to execute functions like logistics, personnel, financial and medical – from the tactical to the national level. The question is: how do you successfully manage that change?

D. Commercial Information Solutions for the Air Force

1. The Air Force systems integration focus is on horizontal integration of manned, unmanned and space systems through machine-to-machine interface of C4I systems. This involves taking stovepiped platforms and putting them on an integration track. In a parallel initiative, Air Force combat operations, combat support, and business function applications are being moved onto the Global Information Grid for common information access. Integration takes place using COTS tools and capabilities, therefore strategic partnerships with private sector vendors is essential.
2. The Air Force IT goal is to provide the information required to support decisions at all levels and across all functions. That entails positive information management, acquisition of services not systems, investment decisions guided by a common IT infrastructure, and incorporation of commercial products and services into the Air Force Enterprise Architecture. The Air Force will migrate to COTS and employ commercial business practices, but different levels will incorporate commercial products and services at different rates.

Main Point Made During Q&A:

- Legacy systems, dissimilar systems even very unique systems can be connected at some level using interface protocols and other products that are commercially available.

IV. IT Fast Track Acquisition – Remarks by the Honorable David R. Oliver, Jr.

- Industry needs representatives in Washington that understand Service requirements as well as Service cultures and sub-cultures. On the military side, there has to be acceptance before there can be adaptation of commercial capabilities – this happens more readily in the combatant commands and in forward units, where the focus is not on long-term development but on mission accomplishment and force protection today and tomorrow. That focus is similar to the corporate focus of monthly reports and quarterly profits.
- For industry, simply appointing a vice president of government sales is well below the critical mass necessary to reach the military market effectively. It requires daily contact and in-depth knowledge by a focused marketing team. Government program managers don't go around the country looking for technology. Venues and mechanisms to bring DoD and industry together are important and should be given priority.
- Global Hawk and Iridium are examples of systems brought to the military without operational concepts to clearly link them to requirements – they were only promising unproven systems with a lot of potential. The acquisition process resisted, though the Global Hawk won sponsors and was soon adopted. Iridium continues to enjoy support from the field, though Services still don't want to fund it. Iridium was instrumental in Afghanistan and will be in Iraq and operational commanders want it. It is the only system today that has worldwide coverage; commanders are changing the way they operate to take advantage of this system.
- Key point on marketing new systems to the Pentagon: you have to have a physical working model to show prospective customers before they will show interest. That is a problem when the equipment is mega-costly and prototypical such as Global Hawk and Iridium.
- The venture capital (VC) model is one method for getting enough private capital to market new technologies, especially the products of small technology companies. DoD may be able to take advantage of VC firms as technology finders, however the VC industry has scaled back almost as fast as it emerged only a few years ago. Also, VC groups are not interested in fielding new technologies. Their interest is in taking a company to critical mass and either offering it for sale or as an IPO. In either case, the focus is not the same as DoD. Hence, once VC group 'find' technology, DoD will likely have to pursue it through other vehicles such as ACTD or OTA.

V. Doing Business with the Defense Department – Industry’s Perspective –
Presentations by IBM, Accenture, SeeBeyond Technologies, Northrop Grumman and Dell Computer Corporation.

A. The industry module highlighted the conceptual differences in the planning approach of industry and the government. Industry concentrates on their business plan that has many parameters not of interest to the government such as profit and market share but does address issues such as productivity and change. The government on the other hand uses the PPBS system that is product and procedure oriented. It is designed to provide multiple levels of oversight. The panel discussion also offered the following ideas.

B. Transformation at corporations occurs regularly, gets started for a lot of reasons and takes many forms. Once undertaken, transformation usually requires the company to change its organizational culture, its business model and its technology base simultaneously and on the fly. Most critical of these is changing the business model that defines how you will do business and how you will succeed. Technology’s only purpose is to support the business model. There was a time when business models were limited by technology, but no longer. Industry is rallying around a relatively coherent set of IT standards, all designed to support the transformation in business models.

C. The main feature of successful transformation is not new technology. It is that sub-optimized or wasted resources have been taken out of the system so more resources can be redirected to mission.

D. Transformation is about business objectives: it is key that you know what you are transforming and why in order to be successful.

E. Business transformations that fail do so by failing at one or more of seven fundamental tasks:

- Setting clear and measurable performance objectives
- Establishing a strategic performance based contract with consultants
- Commitment of top-level leadership to transformation
- Recognition that the core transformation task is Change Management
- Undertaking business process reengineering at a high, enterprise-wide level
- Adopting new processes versus trying to adapt old ones
- Deploying transformation on a broad basis from the start

F. There are disturbing trends in the application of commercial technology to the DoD environment. Most requirements are stated too broadly and tend to be backward looking – they look to apply new technology to the way we have always done business rather than looking at how to improve whatever the process is. Point solutions tend to dominate. There are few accepted standards that apply across the domain and those that are there are not fully implemented within available systems. Integrated solutions are rare and when they do exist they tend to identify a subset of the requirement.

G. One example is the Defense Integrated Military Human Resources System (DIMHRS), which is in acquisition now. It will be a great step in integrating HR pay and benefits across DoD, but it will still exist within a legacy environment that has over 200 system interfaces to legacy systems. So to believe that the implementation of that new technology is going to solve all the interface problems or to address all the enterprise problems for the movement of information would be to not understand the problem.

1. To fully capture all the great work that has been going on in government and industry we need to get to genuine systems integration. We need some clearly defined enterprise requirements that identify DoD's vision of the future. We need identified objectives to which the government is committed – that they will stay the course. We need attention to business processes at the enterprise level, and then apply those down to the functional area being automated.

2. We need government investment – industry will not take on all the cost of bringing all these point solutions together as a by-product of contracts. Government has got to participate in the process. But industry has got to do its share. Of course we have to innovate. We need to contribute to the vision based on what we know is technically feasible. We need to recommend and then accept prescribed standards and then we have to build systems that are standards compliant. We have got to help build a set of integrated, interoperable systems and services to meet the needs.

3. So why is it that we seem to be able to apply these commercial technologies in an industry environment with a high degree of success and when we bring them to the government they often fail? In fact most commercial system applications of any significant size in the DoD fail – again, most fail. Latest number I saw was 48% successful implementation of large commercial implementations – probably a generous number because among that 48% are systems that meet only part of the original requirements that they were built to satisfy.

4. What stands in the way of success when we do those implementations in the government? The usual suspects are poorly defined or unstable requirements, poor communications, and inadequate funding – yet those aren't unique to commercial implementation. What *are* unique are things like inconsistent enterprise-wide application of products and services. In industry, when we decide to implement a particular technology across a company, as we have in frequent transformations at Northrop Grumman, we drive that technology firmly into every corner of the entire company. For reasons of competition as well as Title 10 influence, that frequently doesn't happen in the government, and often 'enterprise' is in the eye of the beholder. The Army may acquire a system for its own use that later gets application at the DoD level. However, the Army is named the executive agent and allowed to control the acquisition process, the requirements definition and the product selection process often defining parameters inconsistent with other parts of DoD.

5. Process incompatibility is another problem. Every commercial product is build with underlying process assumptions based on industry best practices. We go to apply those

to a government environment that has legacy processes and almost always someone will stand up and say we are committed to change the process as necessary to make this work. We know some processes are anchored in law and others in government regulations but we will change all that to make it work. But it rarely happens the way the government believes it will. That is not because the government is not committed to change, it is just far more difficult than we think to change laws and regulations and, as in the case of DIMHRS, a lot of those legacy systems that are tied to the process you are trying to change do not go away. So what happens is we take that commercial product and try to stretch it to fit those processes that the government is using and we either stretch it until it breaks or we don't satisfy all the requirements because we cannot reconcile the processes that underpin the product and the processes that are being used.

6. Lack of sufficient scalability. DoD is the largest enterprise in the world. That is not a non-trivial issue to think about when you are doing a system implementation. Take DIMHRS again: the largest Peoplesoft implementation prior to DIMHRS in the HR pay and benefits domain was just over 400,000 records. DIMHRS, in its initial implementation, will ramp up to 3.5 mil records and could ramp up later to 8 mil if additional bodies of people to be managed are included. That is a significant scalability issue.

7. Two other concerns are DoD use of non-standard interfaces with legacy systems and use of proprietary applications and communications. Finally there is the frustration that what industry uses for security is often not accepted when you get into the military environment, particularly for C4I. While we are seeing Type One encryption and other security measures moved into commercial products they are not moving in at the rate the government would like to see.

8. Another issue is the lack of sufficient interoperability integration testing for commercial products. DoD has long had policies that said, 'when we build our own systems or when they are built on behalf of DoD they must go through integration and interoperability testing. However, for COTS we don't have timely access to those same standards in every case for commercial applications. One solution is that an objective architecture for commercial systems applications for Defense Transformation has to include non-intrusive integration. Application and services have to be adaptable and configurable, scalable organizationally and hierarchically, and they have to be flexible so they can interface with legacy systems.

9. In summary, we can speed the insertion of technology in government by applying commercial technology. But we have to be careful that we don't achieve point solutions that are successful in the short term and tend to cost us far more in the long term. That is what we have found in many of the commercial implementations that have happened to date.

VI. Town Hall Meeting – Presentations and discussion by OSD, Congressional staff and Academe.

A. The most critical Defense question in the IT arena: *Is DoD gaining sufficient access to the cutting edge information technology it needs to transform itself to meet the range of 21st Century threats it will face?*

1. A new paradigm of acquisition should be defined, one that incorporates roles and guidelines for Venture Capital (VC) firms, commercial standards, expanded Other Transaction Authority (OTA), the concepts of both spiral development and spiral budgeting, and expanded use of ACTD.
2. DoD Budget trend is up. DoD committed to 3% of the growing defense budget for science & technology, to be focused on high leverage war winning strategies for the future. IT is a key enabler for DoD to meet its transformational war fighting requirements. DoD IT budget will grow 5% from FY 03-08.
3. The IT industry has been gradually aligning itself to focus on DoD needs and growth. From 1980 to 2000 about 50 major defense suppliers were reduced to five. Consolidated companies have positioned themselves to provide integrated transformational warfighting requirements. Traditional defense companies have all moved strongly into the IT sector. Companies also have taken on a network-centric posture, with all their systems able to be linked to one another, some with their own technology and some with other's technology. Mid-sized firms with IT capabilities are also competing more on a par with the large companies for IT contracts than in typical platform competition.

B. *Defense Procurement Initiatives*

1. We don't need a wholesale demolition approach to improving Defense Procurement, but we need some reform to try to get to more of the commercial technologies that are out there. A very large percentage of money is spent with traditional defense contractors and will continue to be spent with them, often on a sole source basis. We need to ensure there is protection in the system for the government and we have built in a lot of protection over the years that we need to preserve, so don't throw out the whole system. However, one area where we need to improve is on IPR and technical data rights on Part 12 (Streamlined Commercial Item Approach) contracts. These contracts are aimed at acquiring off the shelf products that are out there, however our policies continue to discourage commercial firms from selling to us.
2. Another initiative to reach out to traditionally non-defense commercial companies is the Small Business Innovative Research (SBIR) Program. This program targets companies that have technologies or ideas that are of interest and where DoD can enter into phased agreements for relatively small investment increments. It gives IPR protection to participating companies for five years after they leave the program. SBIR is not a broad program and one way to expand it is to provide more funding so that more companies could use it.

3. The Advanced Concept Technology Demonstration (ACTD) program is well known and aims at leveraging off of current technologies or actual products, to test them for military utility. ACTD is sort of an expedited evaluation, development and initial production program. This has proven to be one of DoD's best initiatives. It is a highly successful and popular program and an indicator of how to seek solutions to other acquisition problems.

4. OTA is an authority for R&D and prototypes. Global Hawk is an example of OTA (and ACTD). Biggest advantage of OTA is that it gives vendors not familiar with FARs a clean slate to start with. They are not required to use any of the FAR clauses. The only requirements are on competition. Most programs have negotiated reasonable if not favorable provisions for IPR, Cost Accounting Standards and audits. About \$6 billion has been invested in OTA since 1995, now down to about \$500 mil/year because Congress imposed an additional condition last year that requires a non-traditional defense company as a prime or significant sub, and cost sharing by that contractor of at least 33%. That provision has discouraged the traditional defense contractors, who had been using the OTA. However, it was intended to reach the non-traditional firms anyway and Congress enacted the provision because its intent was not being met. What is hindering DoD now is that OTA is only authority for prototypes and at some point something is no longer a prototype. Non-traditional companies are put off by the reality that if their system moves to production they are now out from under OTA and have to suddenly comply with numerous FARs governing many of their business practices. Expansion of OTA would help attract non-traditional defense commercial companies, i.e., expanding OTA to cover production.

5. OSD will be trying to do more buying strategically. It will conduct *spent analysis* to see where DoD is spending its money and with whom, and see if there aren't better ways of doing business. DoD cannot buy exactly like the commercial world because of small business laws (which means continuing some set-asides), but some 'new thinking' in the procurement arena can be adopted by DoD. The business side of DoD needs more improvement than the weapons side. If you look at financial management modernization or at the strategic procurement system for contracting, you see areas that are ripe for significant advancement with substantial redirection of sub-optimized resources to be realized.

C. Internal Solutions to DoD Access to Commercial Technologies

1. Logistics really does drive readiness and it is the largest single user of costs (finance, procurement, ordering, inventory, planning, decision making). Each of these functions in DoD are being digitized, however there is no end-to-end application. Ad hoc systems are being installed, primarily non-COTS. DoD is spending \$80 billion/year and not getting world-class performance is inexcusable.

2. We have seen some improvements in supply management: average shelf-to-foxhole deliver in Gulf War was 49 days, today it is 22 days – but that is only an average, not the

standard or expected delivery times. In contrast, commercial delivery times are 1-2 days domestic and 3-5 days international with a 99 probability, using COTS and proven business practices. Why can't DoD come closer to this? There is a long list of familiar barriers: protecting jobs; resistance to changes; huge political resistance (the large depot caucus in Congress is the classic example); classical argument that COTS is *only* a 99% solution so doesn't fill government specs; a military mindset more comfortable with stockpiles than just-in-time (or even small buffers); concerns about cyber warfare disruptions to info system based logistics (yet banks, hospitals, financial systems make due).

3. Spiral development and spiral requirements (per directives of the JROC) of major weapons systems create the need for a third spiral, spiral budgeting. DoD needs to explore that because spiral development means you have continuous R&D, production and support and we need to figure out how to budget for that. Assuming these three spirals get established, we can then insert state-of-the-art commercial technology frequently during development – with two other requirements. One is that you have to be able to do this under OTA so that non-traditional commercial suppliers don't suddenly face unfamiliar FAR requirements. Second DoD must hold to a firm requirement that interoperability be demonstrated before insertion. Interoperability is a new KPP by JROC requirement. In sum: demonstrate interoperability before insertion; and get rid of FAR requirements but still have laws under the OTA. A program that starts under OTA has to be able to go to production under OTA not FAR. We need to get Congress to go along with extension of the OTA and we need to actually start testing for interoperability.

4. If the prime has the capability to develop the entire systems, including spiral development, how do you get Raytheon radar onto a Northrop platform? That is a tough question. Another question is: in a world of acquisition reform you devolve so much responsibility to a prime that you are really talking about the impact of vertical integration and how that interplays with the devolution of authority to a prime. Government will have to structure acquisition strategies to address that thru the merger and acquisition process to stopping mergers where there is too much vertical integration and also address this thru the acquisition side.

D. Congress' Role in DoD Access to Commercial Technology

1. Congress' vision of acquisition reform was translated into legislation in 1994 and 1996. The vision is that DoD and the rest of government access commercial products. FAR Part 12 did that. The Clinger-Cohen Act dealt primarily with IT and how to access IT by streamlining the acquisition system and creating a viable management system. So DoD can get COTS IT if it wants it. One problem is that there is no central place to know what everyone in DoD is buying. NMCI is one recent example. The Navy found that a lot of local systems and in-use applications were not compatible with the new system because only local compatibility was a consideration when they were acquired. In the commercial world, such situations involved similar de-centralized buying but common standards and a gatekeeper to ensure new buys are compatible.

2. The future of IT acquisition as viewed from the Hill is mainly ACTD, OTA and spiral development (plus spiral requirements and spiral budgeting). Congress will watch to see if these are enough. Another interest Congress will watch is to see if the smaller scale projects these initiatives address are really transformational.

3. Congress is interested in Cost Accounting Standards (CAS), the provisions of the Truth in Negotiations Act (TNA). The issue is: are these barriers to business or just viewed as barriers by firms who would not do business with the government even if these parameters were gone? CAS and TNA have always been the issues for sole source contracts, though in a competitive environment there are different issues. On CAS the threshold has been raised so that government is satisfied and won't ask for anything different. However, TNA kicks in at the much lower level of \$500,000 and there are some contractors that we need to work with on a sole source basis that do very little business with the government. DoD, though OMB may propose increasing the threshold for TNA to the Hill.

4. There is some flexibility on Intellectual Property Rights (IPR) that we have not taken advantage of but there are some stumbling blocks as well. One is marching rights, where if a company doesn't actually utilize an invention they have developed on a defense contract DoD can take their invention and give it to another contractor. That scares away a lot of companies. So we are looking at possible ideas to take to the Hill. On intellectual property rights, it is an issue that's been raised but Congress has not seen a specific proposal. The same holds true for expanding OTA to cover production.

5. Another issue with vendors is the Trade Agreements Act, where some companies may not know where their parts are coming from – perhaps a country that has some limits. In writing the laws we don't give enough thought to the lower tiers where the software is really being purchased.

6. How can DoD develop weapons and other major systems so as to field them with the latest technologies, rather than what was available when the decision to 'fix' the technology was made, perhaps years earlier? The new commercial acquisition emphasis and changes brought by Clinger-Cohen aim to address this problem. However, you still are getting the new technology separately, and then once it becomes part of a major weapon or system, it gets treated in concert with the major system and the process slows down. We should explore creating special 'carve-out' authority for such technology within a major program, if the routine process becomes a barrier. It doesn't make sense that barriers are erected because something becomes part of a major system, when otherwise it would be simpler and faster to procure.

7. Another area where a barrier exists is Services contracting. If there is any looming issue for Congress it is the issue of competitive sourcing and out-sourcing – whether it relates to the depots or to services contracting. There are political concerns that cut across both parties so that we'll probably move away from service contracting goals and savings goals, though the way we do service contracting is going to stay just because of the magnitude of the money involved: \$60 billion.