Nine Technology Insertion Programs That Can Speed Acquisition

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"Americans have consistently led in innovation," states a CEO in Thomas Friedman's *The World is Flat*. But times change, writes Friedman. A convergence of technologies and events is leveling the playing field, and "it is open to more people in more places on more days than anything like it ever before." New players, he points out, "can move very fast to adopt state-of-the-art technologies," and "there is simply nothing to guarantee it will be Americans or Western Europeans leading the way."

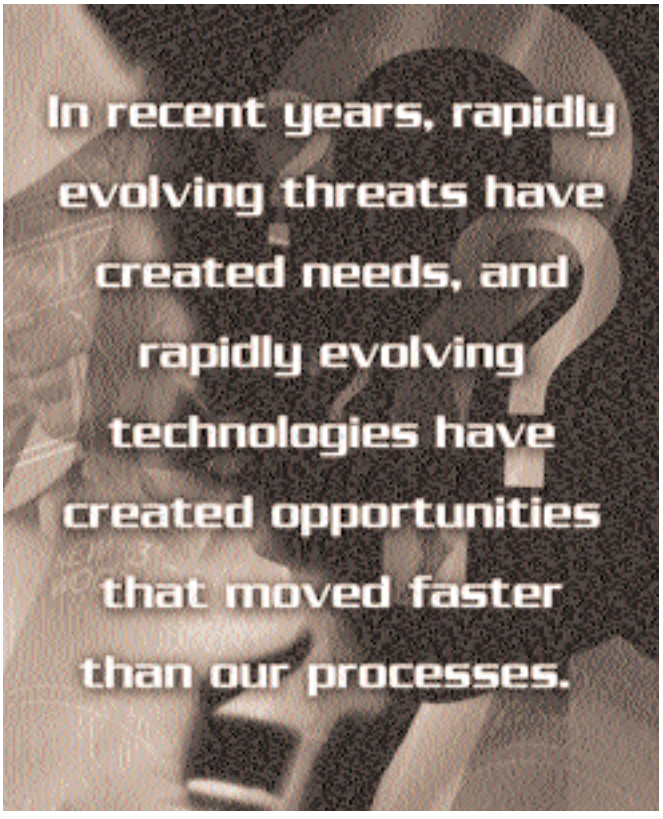
That message applies to our national security. U.S. forces have long had technological superiority, but nothing guarantees it. The Department of Defense must innovate faster than ever before because our adversaries have equal opportunities. To meet this challenge, several technology insertion processes have been consolidated at the Office of the Secretary of Defense, and they can do a lot to speed acquisition.

We've Come a Long Way

We are already seeing the world that Friedman writes about. In recent years, rapidly evolving threats have created needs, and rapidly evolving technologies have created opportunities that moved faster than our processes. In the words of Acting Deputy Secretary of Defense and Secretary of the Navy Gordon England, "The greater institutional risk for DoD is overreliance on traditional platforms and delaying the advent of new technologies and systems."

We must be faster, and as England said, "It's evident that DoD will need to improve continuously its processes for technology insertion into systems."

We've built a good foundation. Over the last decade-and-a-half, DoD has strengthened technology insertion processes and created more, and they have made a difference. Before some processes existed, it often took a long time for technology to be widely used. Drones with cameras were used in Vietnam, and DoD pursued many unmanned aerial vehicle programs from 1975 to 1995, but most were cancelled. After establishment of one technology insertion process—the Advanced Concept Technology Demonstration program—UAVs [*unmanned aerial vehicles*] saw widespread use in a relatively short period. Now these processes are hitting their stride—and they can do even more.



It is also significant that several complementary processes have been consolidated under one office, that of the deputy under secretary of defense (advanced systems & concepts). This office—Advanced Systems and Concepts—specializes in moving technology. For example, it focuses on mature technologies instead of less proven ones that often delay schedules and drive up costs. Moving technology forward is challenging. Some were skeptical about the Predator UAV because it didn't fit old operational concepts. Advocacy helps technology insertion overcome obstacles and get funding, and that's what this office does.

The office does some heavy lifting. Its technology insertion processes are not the only ones in defense, but the office does what most others do not—it focuses on joint

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needs and capabilities, spanning more than one Service or agency. In pursuing needed technologies, it reaches out and forms partnerships with DoD and non-DoD agencies, labs, universities, industry, and even other nations.

Moreover, these technology insertion processes feed every phase of acquisition, accelerating each one faster than would otherwise be the case. This is how it works.

Using R&D That's Already Been Done

The Independent Research & Development Program

The Air Force needed a paint that, when photographed with a special camera, showed pressure distribution on aircraft models in wind tunnels. The results would help reduce aircraft development times. A search of an R&D database found a project that met these needs, saving time and an estimated $10 million in developmental costs.

In pursuing a technology solution, there is often a good chance some aspect of R&D has been done by U.S. industry. The Independent Research & Development Program seeks to leverage industry's R&D, which is $3 billion annually in the defense industry and nearly $140 billion in U.S. industry. Companies voluntarily submit R&D project descriptions for inclusion in the independent R&D database, which offers a way to publicize abilities to potential DoD customers. The database has over 165,000 project descriptions, which are handled as proprietary information. Using existing R&D can avoid reinventing the wheel.

Using World-class Developments

The Foreign Comparative Testing Program

U.S. Special Operations Command urgently needed a lightweight machine gun. Belgium's FN Herstal had one that seemed to fit the bill. The machine gun was successfully tested and was in the hands of U.S. forces in Afghanistan and Iraq in less than 12 months.

If U.S. industry has not developed it, the search turns to other nations. The Foreign Comparative Test program searches for world-class technologies, evaluates them for U.S. use, and if successful, they are transitioned to acquisition programs. Avoiding new development saves an average of 5.5 years in acquisition time. Such transitions have also enabled DoD to avoid an estimated $6.1 billion in development and testing costs. These technologies can provide U.S. forces with new capabilities, as well as improve legacy systems. Once successfully tested, technologies can be licensed for U.S. production, creating dozens of new companies.

Moving Key Technologies out of Labs Faster

The Technology Transition Initiative

In Iraq, a data mining tool searches multiple databases, helping Marines find battlespace information faster than previously. The technology matured faster than the budgeting process could fund rapid fielding. The Technology Transition Initiative funded its testing and integration into the Marines' intelligence network, enabling fielding two years ahead of schedule.

Technologies develop rapidly today, but the budgeting process takes two to three years to fund transition from the lab to the field. Consequently, many technologies fall into "Death Valley" from obsolescence or lack of funding. The Technology Transition Initiative provides funds for selected technologies to rapidly complete transition requirements. Projects are nominated annually by Services, agencies, and combatant commands. Selections are based on a technology's warfighting value, joint use, feasibility of fielding in under four years, and a Service or agency's commitment to fund part of the cost and eventually procure the technology.

Achieving Milestone B Faster

The Advanced Concept Technology Demonstration Program

Army Gen. Tommy Franks wrote that at the start of operations in Afghanistan in 2001, "America … deployed military technology that hadn't even been imagined when I [was] with the 1st Cavalry troops in Desert Storm." Of the new technologies used in Afghanistan, 38 came from the ACTD program, initiated in 1994 when the acquisition process averaged 11 years to field a system.

The ACTD program provides a try-before-buy opportunity, and if successful, it can jumpstart the acquisition process. Based on a need, an ACTD introduces scientists to warfighters, and together they insert a technology into a concept, which is demonstrated in one to three years.

Where to Find More Information

Advanced Concept Technology Demonstration Program
<www.acq.osd.mil/actd/>

Advanced Systems and Concepts Office
<www.acq.osd.mil/asc>

Defense Acquisition Challenge Program
<www.acq.osd.mil/cto/>

Defense Production Act Title III Program
<www.acq.osd.mil/ott/dpatitle3/>

Foreign Comparative Testing Program
<www.acq.osd.mil/cto/>

Independent Research & Development Program
<www.dtic.mil/ird/>

ManTech Program
<https://www.dodmantech.com>

Technology Transfer Program
<www.acq.osd.mil/ott/techtransit/>

Technology Transition Initiative
<www.acq.osd.mil/ott/tti/>

For example, an ACTD took the Predator UAV from concept to field in 30 months. If a technology works, it can start acquisition at Milestone B or be inserted into an existing program. It can also be left for warfighters to use. And ACTDs can help avoid unaffordable approaches. One ACTD was terminated after finding that it took an unaffordable number of aircraft to intercept ballistic missiles in flight, thus preventing DoD from spending $400 million on this intercept system. For more information, visit <www.acq.osd.mil/actd/>.

Accelerating Joint Capabilities

The Joint Capabilities Technology Demonstration Program

"The rapidly changing international environment and the global war on terrorism require that we create joint capabilities more quickly," states Air Force Gen. Richard Myers, former chairman of the Joint Chiefs of Staff. "However, the creation of such capabilities has often been slow and disruptive, as the Joint Defense Capabilities Study pointed out."

To speed joint, as well as coalition and transformational capabilities, the Joint Capabilities Technology Demonstration Program was initiated. The program collaborates with the Joint Capabilities Integration and Development System, in which combatant commanders determine joint needs early in resourcing efforts. JCTDs are launched to pursue such needs, using lessons from current operations. JCTD personnel will work closely with combatant commands to rapidly identify emerging needs and then with industry and Service and agency labs to expedite solutions. Normally, JCTDs will reach final demonstration phase in two years, demonstrating 50 percent of all projects by then, and will complete all demonstrations in three years. JCTD products will transition to joint acquisition programs.

Speeding DoD Technology to Private Sector Manufacturers

The Technology Transfer Program

During the Cold War, moving technology to industry was slow with few established processes. Today, technology transfer teams and mechanisms rapidly move lab technologies to the commercial sector. When anthrax attacks hit in October 2001, Army scientists began developing biological sampling kits, with a technology transfer team working concurrently to get a patent and a manufacturer. Upon completion of testing, the kit was in the hands of a manufacturer in a matter of months.

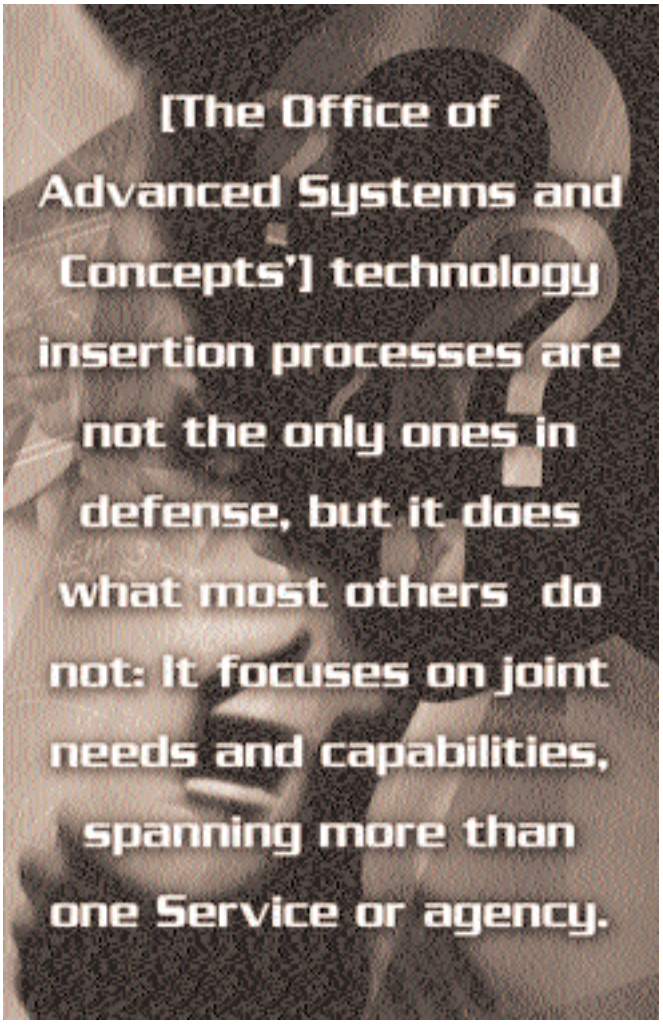
The Technology Transfer program moves DoD lab technology to industry so that it can be made for defense and—if possible—for the commercial sector, thereby lowering production costs even more. At each lab, technology transfers are facilitated by an Office of Research and Technology Applications and patent attorneys. They arrange agreements between labs and industry, enabling the two to work together on R&D projects. They also secure patent licenses, providing protection for companies producing the technology and revenue for labs and developers. Additionally, the program uses "matchmakers," like Montana State University's TechLink, to make lab technologies known to industry.

Faster, Better, and Cheaper Manufacturing

The ManTech Program

In 2003, the Air Force needed to surge production of Joint Direct Attack Munition kits, which convert unguided bombs into precision munitions. The ManTech program helped the manufacturer better coordinate suppliers, represented by several small and medium businesses providing 95 percent of the kits. As a result, suppliers averaged a 60 percent reduction in cycle time and a 25 percent productivity improvement.

The ManTech program improves industry processes, which results in systems that are more rapidly available, capable, and affordable. Some projects improve fabrication. One such project matured the fabrication of composites used in Super Hornet aircraft, enabling a 40 to 50 percent increase in range. Some improve enterprise-wide



processes. ManTech linked the military clothing supply chain, reducing inventories by $77.9 million and cutting manufacturing lead times from over 90 days to under 14 days.

Speeding Production of Critical Technologies

Defense Production Act Title III Program

A special tape is needed for second-generation superconducting to result in smaller and more efficient electrical production. This development could mean smaller ships, more compact directed energy systems, and other possibilities for defense and commercial industry. However, the tape is expensive and presently produced only in small quantities. An initiative is under way to increase production and lower costs, making second-generation superconducting available five to seven years earlier than otherwise feasible.

The Defense Production Act Title III Program assures domestic production of critical defense technologies when firms cannot meet military needs or delay production. The program provides incentives, like purchases or commitments to buy critical technologies. The program may also help install equipment or improve processes. Additionally, it may promote development of substitutes. Generally, the program seeks production in three areas: stronger and lighter structural materials, which can mean faster systems with greater ranges and payloads; advanced electronic materials leading to smaller, faster, and more reliable micro-electronic devices; and advanced electronic devices or components to enhance system performance.

An On-Ramp for Industry Innovation

The Defense Acquisition Challenge Program

This program began in 2003 and is already having impact. At Camp Pendleton, Calif., Navy corpsmen or medics bound for Iraq and Afghanistan train on digitized mannequins that simulate a range of combat trauma. At Fort Campbell, Ky., troops in the 101st Airborne Division train for Iraq using virtual simulation. In Iraq, a spray-on technology is providing a better way of cooling electronics.

Anyone can have a good idea, and that is the premise of the Defense Acquisition Challenge Program. It provides the opportunity for anyone in industry or government to propose cost-saving technologies that improve a program's affordability, manufacturability, performance, or capabilities. The intent is to speed insertion of technologies in defense and reduce spiral development risks. The program also enables a broad range of companies to participate, thus expanding the defense industrial base. The program annually issues a Broad Agency Announcement (BAA) soliciting "challenges" and selects promising technologies for evaluation.

Leveraging the Advantages

A world of proliferating technological development is the challenge ahead—but DoD has a significant advantage. "A common problem for many individuals and organizations is how to speed up the rate of diffusion of an innovation," writes Everett M. Rogers, pioneer of diffusion of innovations theory. DoD has processes to do that, and DoD is using them to move technologies faster than ever before.

There is another challenge, one mentioned by England: DoD must continuously improve its technology insertion processes—and that brings us to a DoD advantage. The Department has a champion for such improvements as a result of the consolidation of these programs under the Office of Advanced Systems and Concepts, which continually refines and advocates changes for faster and more effective processes and ensures that the programs increasingly work together, leveraging off each other and promising greater speeds and efficiencies. Now it is a matter of using these advantages to their fullest because today—more than ever—speed counts.

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