Defense AT&L

November-December 2009

A PUBLICATION OF THE DEFENSE ACQUISITION UNIVERSITY

The Future of Acquisition Excellence

ALSO

CONTENTS

DEPARTMENTS

Change in Subscription Status

Please use the mail-in form on page 65.

Have you moved? Do you need to change the number of copies of *Defense AT&L* you're receiving? Do you want to discontinue your subscription?

Please fill out and sign the form on page 65 and mail, fax, or e-mail it back to us. You can also find the form by going to <www.dau.mil/pubscats/pages/defenseatl.aspx> and clicking "Subscribe to *Defense AT&L*."

Allow eight weeks for your request to take effect.

Defense AT&L
Vol XXXVIII
No.7, DAU 211

Published by the
DEFENSE ACQUISITION UNIVERSITY

Letters to the Editor may be e-mailed to datl(at)dau(dot)mil or mailed to the address in the next column. (Please use correct e-mail protocol. We spell out to prevent spam generated by the address in the online magazine.)

Article preparation/submission guidelines are located on the inside back cover of each issue or may be downloaded from our Web site at <www.dau.mil/pubscats/pages/defenseatl.aspx>.

Inquiries concerning proposed articles can be made by e-mail to datl(at)dau(dot)mil or by phone to 703-805-2892 or DSN 655-2892.

Subscribe/unsubscribe/change of address: Fill out, sign, and mail the postage-free self-mailer form at the back of this issue, or download the form at <www.dau.mil/pubscats/pages/defenseatl.aspx>.

Privacy Act/Freedom of Information Act
If you provide us your business address, you will become part of mailing lists that are public information and may be provided to other agencies upon request. If you prefer not to be part of these lists, use your home address. Do not include your rank, grade, service, or other personal identifiers.

Defense AT&L (ISSN 1547-5476), formerly *Program Manager*, is published bimonthly by the DAU Press and is free to all U.S. and foreign national subscribers. Periodical postage is paid at the U.S. Postal Facility, Fort Belvoir, Va., and additional U.S. postal facilities.
POSTMASTER, send address changes to:

DEFENSE AT&L
DEFENSE ACQUISITION UNIVERSITY
ATTN DAU PRESS STE 3
9820 BELVOIR ROAD
FT BELVOIR VA 22060-5565

The Future of Acquisition Excellence

Army, Navy, and Air Force Acquisition Strategies

James Thomsen
Principal Civilian Deputy Assistant Secretary of the Navy for Research, Development and Acquisition

Lt. Gen. N. Ross Thompson III
Military Deputy, Office of the Assistant Secretary of the Army for Acquisition

Lt. Gen. Mark D. Shackelford
Military Deputy, Office of the Assistant Secretary of the Air Force for Acquisition

This is a very challenging period of time for the Department of Defense and the nation.

The president and the secretary of defense have established acquisition reform and improving acquisition outcomes as a top priority. President Barack Obama's March 4, 2009, memorandum, "Government Contracting," communicated his intent that the acquisition workforce have the capability and capacity to manage and oversee acquisitions appropriately. On April 6, 2009, Secretary of Defense Robert Gates announced his intention to significantly improve the defense acquisition workforce by increasing the size of the organic workforce by 20,000 through fiscal year 2015. The department's acquisition workforce improvement strategy reflects both the administration and congressional commitment to right-size, rebalance, and restore the quality of the acquisition workforce. This strategy is supported by workforce initiatives that will grow, enhance, and sustain a high-quality workforce. This includes recruiting and hiring, retention and recognition incentives, and training and workforce development initiatives.

On October 26, 2009, the Under Secretary of Defense for Acquisition, Technology and Logistics Dr. Ashton B. Carter chaired the DoD Acquisition, Technology and Logistics Workforce Senior Steering Board. In opening the board, he stated: "The department is in an enviable position because President Obama and Secretary Gates intend to improve the acquisition process and rebuild and reshape the acquisition workforce. In addition, there is congressional support on both sides of the aisle. We must grow and reshape the workforce to meet current needs, with special emphasis and focus on improving workforce quality."

The DoD acquisition mission represents the largest buying enterprise in the world. Today, there are over 100 major defense acquisition programs with an investment of more than $1.6 trillion. The defense acquisition workforce has experienced a significant increase in demand for services; contracting; and the overall acquisition workload to include support for expeditionary, counter-insurgency, and other critical missions. In 2001, the defense department spent $138 billion on contracts, and in 2008, spending reached $396 billion—$202 billion of it was for services. During this period, the use of contractor support personnel increased significantly while the organic acquisition workforce declined. Between 2001 and through 2008, the size of the organic defense acquisition workforce (civilian and military) had a slight decrease of 2.6 percent.

In this magazine, we highlight acquisition workforce initiatives in the Army, Navy/Marine Corps, and Air Force. Lt. Gen. N. Ross Thompson III, military deputy, Office of the Assistant Secretary of the Army for Acquisition; James Thomsen, principal civilian deputy assistant secretary of the Navy for research, development and acquisition; and Lt. Gen. Mark D. Shackelford, military deputy, Office of the Assistant Secretary of the Air Force for Acquisition, shared insights about their respective programs and services. I thank them for their time and for their contribution to *Defense AT&L* magazine.

Frank J. Anderson,
President, Defense Acquisition University
and Director, Human Capital Initiatives

Q
Can you give an overview of your roles and responsibilities?

Thompson
As the principal military deputy to the assistant secretary of the Army for acquisition, logistics and technology, I am delegated responsibility as the Army's director for acquisition career management to assist the ASA(ALT) in his role as the Army acquisition executive performing duties with respect to the AT&L workforce. The DACM acts under the authority of the secretary of the Army and the AAE to manage the integrated execution and oversight of the AT&L Workforce Education, Training, and Career Development Program within the Army.

The Defense Acquisition Workforce Improvement Act focuses heavily on a systematic approach for making the acquisition workforce more professional. DAWIA addresses specific requirements for work assignments, experience, education, and training. In my role as the DACM, I am responsible for the Army workforce's compliance with DAWIA and the implementation of civilian and military acquisition workforce education, training, and career development programs and activities. A major challenge and focus for today's Army is to integrate military and civilian acquisition workforce members' education, training, and career development into the mission of the organization. The DACM must communicate to commanders and leaders—at all levels—a clear understanding of their roles and responsibilities to meet this challenge.

I also advise the ASA(ALT), the Army chief of staff, and the secretary of the Army on the aspects and impact of legislation, policies, procedures, and programs that may have a broad political and public impact on the Army's mission. In this advisory role, I help formulate policy for the Department of the Army.

In addition to serving on the editorial board of the *Army AL&T* magazine and occasionally testifying before congressional committees, I represent the Army and DoD on matters relating to acquisition program areas, including interdepartmental committees organized to develop national policy. I serve as a member of multiple standing boards, such as the AT&L Workforce Senior Steering Board and the AT&L Workforce Management Group. To encourage professional development in our workforce, I publish a monthly professional reading list that serves as a resource for busy acquisition professionals. The list highlights at least two books or articles that supplement current acquisition workforce and career development issues or challenges.

Thomsen

The secretary of the Navy and assistant secretary of the Navy for research, development and acquisition established the position I hold—principal civilian deputy assistant secretary of the Navy for research, development and acquisition—in June 2008 to be the senior career executive for acquisition in the Department of the Navy. Some of the priorities of the position are to rebalance the naval acquisition workforce and to reinforce our technical infrastructure that includes our warfare centers and Naval Research Laboratory. They are priorities because of the nearly 50-percent reduction in our acquisition workforce since the 1990s, with particular erosion in our technical bench strength. Yet recently, the Navy has had more ship and aircraft designs under way than any time in the previous 30 years. In addition to the normal responsibilities of overseeing acquisition program execution, the secretary and assistant secretary gave this office a couple of strategic priorities relating to the workforce:

- Reverse the Department of the Navy's overreliance on contractors performing core acquisition functions. We want to reclaim a deeper understanding of the real technical and cost trade-space of our programs since, ultimately, we are responsible to the taxpayer for making quality decisions in what we are buying. That is especially true in the pre-Milestone B phase of our programs. It's important that we strike the right balance among outsourcing and insourcing domain expertise. The Department of the Navy should not contract out its ability to understand military problems in technical terms, but it should know who has the potential to solve those problems and be able to verify a technically correct solution when it is presented. This domain expertise is important for all aspects of acquisition. Take cost estimating, for example. You can have the best cost-estimating process in the world, but it will be flawed unless it is performed by knowledgeable technical personnel who have actually done some part of the function themselves. In addition, we have specific congressional language in the fiscal year 2008 National Defense Authorization Act (NDAA) that prohibits the Services from contracting for lead systems integrators beginning in fiscal year 2010. That compels us to rebuild that part of the engineering (and business) domain expertise that we have been steadily outsourcing for years.

- Deliberately steward the Department of the Navy's warfare centers/labs to ensure long-term effectiveness. The Department of the Navy has a proud history of a solid science and engineering foundation. The intentional investment in our technical infrastructure and the ability to team with industry is, in short, a principal reason we have a high-tech naval force today. Our labs revolutionized naval gunfire, launched the first GPS satellite, originated 80 percent of the world's air-launched ordnance, and developed the first ship-launched ballistic missiles. Today, the labs represent more than 50 percent of our naval acquisition workforce and are the science and engineering foundation for our programs. Yet a Center for Naval Analysis study recently found "the Navy's in-house technical capability, most of which resides in the warfare centers, still exists, but is thin in several areas and rapidly losing capability and capacity. Moreover, these centers/labs have lost 44 percent of their personnel since 1991, while workload significantly increased after 9/11."

My office works with the Office of Naval Research and the systems commands to restore and invest appropriately in our future technical capability. We expect to grow the technical part of our workforce by about 10 percent over the future years defense program. We are recruiting scientists and engineers using funds authorized by NDAA Section 852 and Section 219. Both of those authorizations were put in place to ensure we are investing properly in our acquisition workforce of the future, and they have already served us well. Using these authorities, in just four months, we hired over 475 acquisition personnel, with only 11 people declining our job offer. That's a phenomenal acceptance rate.

Shackelford

The assistant secretary of the Air Force for acquisition (SAF/AQ) works closely with other Air Force headquarters offices to assist the secretary of the Air Force in carrying out his or her responsibilities. As the military deputy for the SAF/AQ, I have overall responsibility for acquisition systems for the Department of the Air Force (except certain space acquisition authority reserved for the under secretary of the Air Force); and assist in SAF/AQ's roles of serving as senior procurement executive, service acquisition executive for non-space related programs, and a member of the Air Force Council.

The military deputy is the principal advisor to the Air Force chief of staff on all acquisition and contracting issues, serves as military director to the Air Force Scientific Advisory Board, and is a member of the Air Force Council. The military deputy establishes, maintains, and fosters scientific and technical interchange and working relationships with and among private, quasi-governmental, United States, and international organizations and foreign governments in furthering programs of the United States and Air Force development interests. The military deputy:

- Presents research and development technology and new concepts/initiatives
- Prepares, presents, and defends the fiscal budget to Congress and allocates/reallocates monies to accommodate program changes, operational necessity, or developmental priorities
- Is responsible for efficient research, development, and acquisition through utilization of current technology, inter-Service knowledge transfers, industry-sponsored programs, and foreign governmental exchanges
- Excepting program approval and cancellation, is responsible for all actions necessary to research, develop, and

acquire systems and subsystems to maintain effectiveness, sustain modernization, or increase the Air Force operational worldwide capability.

The military deputy is accountable to the secretary of the Air Force, SAF/AQ, and the Air Force chief of staff for the cost, schedule, and technical performance of Air Force weapons systems (except those assigned to the under secretary of the Air Force for space systems).

An interesting aspect of the military deputy position is that SAF/AQ may delegate certain roles and responsibilities to the military deputy; however, the military deputy may not act as SAF/AQ. In accordance with Title 10 of the U.S. Code, an active duty officer may not hold or exercise the functions of a civil office, such as that of the SAF/AQ, that requires appointment by the U.S. president with the advice and consent of the Senate.

Q

Secretary of Defense Robert Gates has proposed hiring 20,000 new acquisition professionals by 2015. Thousands of new jobs would be created, and contractors are expected to convert to government jobs. Can you discuss your military service's plans in place to respond to the hiring and conversion?

Thompson

The Army Acquisition Corps' plans for hiring and converting over the future years defense program are as follows: conversion of approximately 3,200 contractor positions performing acquisition career field-specific actions to Department of the Army civilian positions and growth of approximately 1,900 acquisition career field-specific positions with a heavy emphasis on contracting and cost and pricing positions. To date, we have hired more than 300 people within the contracting acquisition career field. Plans are currently being formulated for our other acquisition career fields. We plan on using every available authority to expedite the intake of quality professionals into the Army acquisition workforce. The number of positions converted will likely grow as we identify the critical skills and refine the numbers that will be Department of the Army civilians.

Thomsen

The Department of the Navy will increase its acquisition workforce by at least 5,000 government employees, or about 12 percent, over the next 5.5 years. Of those, about 3,500 will be contractor conversions, which will help reverse outsourcing our core acquisition functions. We will also hire at least 1,500 new government employees to reinforce the foundation of our Navy/Marine Corps acquisition workforce.

These new hires will strengthen the naval acquisition workforce in four principal areas. The first is systems engineering, and I've already addressed the need for systems engi-

neering and technical domain expertise. The second area is contracting officers. We estimate that we need to grow the contracting officer part of our workforce by at least 30 percent. When I was a program executive officer, it was not uncommon for my industry counterparts to ask me to increase the capacity of our system commands' contracting officer workforce. They knew what I did: that knowledgeable and skilled contracting officers were critical to the acquisition team and our ability to execute programs on time and budget. The third area is cost estimating. In order to set budgets appropriately, it is critically important to have credible cost estimates to which we can budget. It is also important for us to understand the relationship between a program's cost elements and technical options before we commit taxpayer money to a legally binding contract. Another area of growth is adding qualified program managers.

Shackelford

The Air Force began working initiatives to increase the size of our acquisition workforce in the fall of 2008, when the SAF/AQ directed the Air Force program executive officers to re-examine and provide acquisition workforce requirements for our product centers. After review by the Air Staff and Air Force Corporate Structure, the Air Force validated 2,062 acquisition workforce positions, with 1,804 civilian, 247 officer, and 11 enlisted positions. Those positions were incorporated in the fiscal year 2010 president's budget and will be phased in between fiscal year 2010 and fiscal year 2013.

Our next step was to assess additional acquisition manpower needs at the Air Logistics Centers, which are currently estimated to total approximately 900 positions, of which about 850 are civilian. Finally, we identified over 900 contractor positions for conversion to civilian acquisition positions, to include acquisition managers, systems engineers, contracts experts, cost and pricing analysts, and others. The conversion effort started in early fiscal year 2009 and will continue through fiscal year 2013.

From the headquarters level, we're providing oversight and tools that help the field keep positions coded properly and that improve the accuracy of the acquisition data in the military and personnel data systems. The Air Force today has a very accurate count of our acquisition workforce, thanks to the diligence of our Acquisition Professional Development Program managers and manpower professionals at our acquisition centers. Those individuals work with supervisors and workforce members to ensure that acquisition positions are coded properly to reflect the acquisition functional specialty and certification level required. Additionally, in the last few years, we've implemented metrics that give managers at all levels visibility into the qualification status of members in critical acquisition positions (including key leadership positions), as well as certification and professional currency status of the workforce. Our metrics help promote accurate position coding, which is the key to getting and maintaining an accurate count of the acquisition workforce.

Our strategic planning is focused on ensuring we have the workforce we need to meet current and future mission requirements, including the right competencies and the right numbers. To help guide our strategic planning, we've completed a RAND Corporation study of Air Force cost estimators and have undertaken reviews of price analysts and future engineering requirements. Those studies will help inform our decisions as we specify hiring targets under the growth strategy announced by DoD.

For the long term, we are working with Air Force manpower experts—building on lessons learned from our first-generation acquisition manpower model—to develop a family of corporate Air Force-sanctioned, objective-based, workload-driven manpower models that predict, define, and validate the manpower requirements needed to efficiently launch and manage a weapon system program. When completed, the Acquisition and Sustainment Unit Manpower Models will give us the ability to quantify the manpower resources needed for new, existing, and/or changing missions. We expect to have several of these models available for use on the fiscal year 2012 Program Objective Memorandum.

We believe the Air Force can meet the higher targets for hiring and conversions that Secretary Gates has established, and we're working closely with the USD(AT&L) to address the funding and specific functional allocations.

Q

Section 852 of the fiscal year 2008 National Defense Authorization Act establishes the Defense Acquisition Workforce Development Fund. The fund provides DoD agencies and services with money to recruit and retain talented members in the acquisition, technology, and logistics career fields. Can you discuss how your military service is preparing to use the current and future funds?

Thompson

The U.S. Army Acquisition Corps utilized several factors during the Section 852 requirements generation process for fiscal year 2008. We relied heavily on the deficiencies and recommendations annotated in the recent Gansler Commission Report (also known as the Report of the Commission on Army Acquisition and Program Management in Expeditionary Operations) with principal focus on improving the Army's contracting community. Secretary of the Army Pete Geren chartered the commission in October 2007; and chaired by Dr. Jacques Gansler, under secretary of defense for acquisition, technology and logistics from 1997 to 2001, the commission provided an independent, long-term, strategic assessment of the Army's acquisition and contracting system and its ability to support expeditionary operations and sustained high-operational demand in an era of persistent conflict. Recommendations

Incremental acquisition strategies that deliver early, if only partial, operational capability will be pursued, rather than strategies that deliver the 100-percent solution.

in the commission's report determined four overarching strategies to ensure the success of future expeditionary operations to which the Army is responding:

- Increase the stature, quantity, and career development of military and civilian contracting personnel, particularly for expeditionary operations
- Restructure organization and restore responsibility to facilitate contracting and contract management
- Provide training and tools for overall contracting activities in expeditionary operations
- Obtain legislative, regulatory, and policy assistance to enable contracting effectiveness in expeditionary operations.

Recognizing the paramount importance of our acquisition, logistics, technology and workforce database system, we invested considerably in enabling information system enhancements to the Army's Career Acquisition Management Portal. Additionally, we wanted to ensure a proper balance of all acquisition workforce initiatives as they pertain to right-sizing (recruitment and retention), development, training, and education, at all levels and in all disciplines. Lastly, the need to sufficiently recognize and retain our acquisition workforce was a major emphasis for Section 852 funds.

As a result, we are presently executing our fiscal year 2008 allocation of $69.6 million, with 72.57 percent of the fund dedicated to recruitment—we've hired 419 interns, three highly qualified experts, 24 journeyman, and 90 Student Career Experience Program students. The Army's retention efforts, at 13.14 percent of the fund, includes special-emphasis programs like the Student Loan Repayment Program—with the pilot offering attracting over 1,200 applications (with 438 approved)—and the Civilian Incentive Program dedicated to the provision of recruitment and retention incentives. Lastly, our training efforts, at 14.29 percent of the fund, ensure state-of-the-art facilities and programs to increase the Department of the Army throughput capability in 22 programs (for example, school of choice, Mission Ready Airmen Course, and Darden's Commercial Business Environment Course). We have also activated our first Active Duty Special Work Program for the Reserve Component/National Guard, enabling one full year of hands-on contracting experience prior to contingency contracting assignments.

Thomsen

For fiscal year 2009, the Department of the Navy received about $50 million in Section 852 funds. The Department of Navy is already using these funds to aggressively hire more interns, mid-career journeyman, and highly qualified experts. The funds have helped us establish a two-year journeyman program, which is hiring more than 150 civilian personnel annually. They have also helped expand our three-year acquisition intern program to over 400 new interns this year, with plans to hire more next year. Both programs have already met

their fiscal year 2009 hiring goals. These new hires are filling positions in systems engineering, contracting, business cost estimating, and program management.

We are not having trouble hiring qualified personnel (excepting a few niche areas). The economy has had something to do with it, but we also believe it's because of the exciting work we offer—as it's been described by a number of people at our hiring events. I don't have a metric, but we are also sensing a renewed interest by people who favor public service.

Shackelford

Our acquisition human capital strategic plan includes a focus on initiatives to attract, select, develop, and foster talent with the competencies we need to do the current and future acquisition mission. It establishes a competency management framework to support hiring and succession planning as well as initiatives to identify required critical skills, replenish the workforce, advance workforce development, and foster knowledge transfer. To accomplish these objectives, the Air Force is making full use of the funds provided by Section 852.

Section 852 funding has enabled us to jump-start hiring today while we work through the corporate process to establish permanent civilian and military authorizations for a larger workforce, sized to meet program requirements. Based on needs gathered from the Air Force acquisition community, our fiscal year 2009 Section 852 hiring targets include more than 300 additional interns, at least 130 additional participants in the Student Career Experience Program, and at least 330 experienced journey-level overhires. We distributed the first allocated Section 852 funds to Air Force acquisition commands in mid-January; and our product, logistics, research and development, and test centers are hard at work recruiting and hiring using those resources.

We are also investing more in the people we already have. Our human capital strategic plan outlines four major objectives to increase the effectiveness of the workforce: identify and address training gaps; train people before they are assigned to positions of higher responsibility; emphasize professional currency; and revitalize position qualification and tenure management. Here again, we're leveraging the Acquisition Workforce Development Fund to address training capacity shortfalls, and that includes sending more civilians to acquisition initial skills courses and increasing seats in other courses we believe can help improve acquisition outcomes. We've also been working closely with Defense Acquisition University to focus their use of the fund on high-priority Air Force training needs.

Q

A major challenge in recruiting talented acquisition professionals—particularly those in the science, mathematics, technology, and engineering career fields—is that industry has been a more lucrative career path. What plans are in place to draw talented professionals, including recent college graduates, into the DoD acquisition workforce? And what are the plans being developed to keep them in the government?

Thompson

In general, we are investigating various methods of attracting and retaining the best and the brightest. When we find people who have proved themselves to be effective, especially in areas that mirror our own best practices, we intend to leverage them to the maximum extent possible. As I mentioned earlier, the Army recently deployed a centrally managed and centrally funded Student Loan Repayment Program, whose pilot attracted over 1,200 applications; and the Civilian Incentive Program focused on providing certain recruitment and retention incentives. We are presently awaiting feedback from the acquisition community on requirements for the Civilian Incentive Program, but I anticipate a positive response very similar to that obtained by the Student Loan Repayment Program. Additionally, we have expanded our use of targeted job fairs throughout the continental United States in order to spread the word about exciting job opportunities with the U.S. Army Acquisition Corps.

Thomsen

We are hiring qualified personnel much faster than previously. In the past, our typical hiring cycle was around 175 days—from creating the vacancy announcement to getting someone to accept an offer. Today, we can hire qualified personnel within five days under the expedited hiring authority established by Congress in Section 833 of the fiscal year 2009 National Defense Authorization Act. We also have been given direct hiring authority for individuals with advanced degrees. This has been especially helpful in quickly bringing aboard notable scientists and engineers.

Through public outreach and recruiting events, our material acquisition commands have interviewed hundreds of mid-career candidates and have had a terrific response. We are not having problems hiring folks in most career fields, even at the mid-career level. As far as interns (a program that encompasses more than new college graduates) are concerned, we have already filled our fiscal year 2009 target of 400 positions, from over 4,000 applicants. Because of the economy, we have also had the luxury of conducting targeted hiring. For example, one of our acquisition commands, the Naval Sea Systems Command, recently went to Detroit, Mich., to recruit skilled technical and business professionals who have left the automobile industry. They came back with an armful of qualified candidates.

Within the Navy, we are also pursuing uniformed officers who are separating from the Service. These are typically very talented individuals with business or technical degrees from the Naval Academy or other outstanding colleges, and many have a desire to support the Department of the Navy as civilians. We have teamed with the Naval Personnel Command to provide specific information on the acquisition workforce to those members as they separate from the Service. For ex-

ample, we targeted officers at the naval flight school in Pensacola, Fla., who were required to separate from the Service for various reasons. We held a special recruiting event just for those officers and recruited them for entry-level and mid-level jobs. We think that's pretty appealing for officers at the O-1 to O-3 levels, and it's been extremely successful. So far, we have hired over 90 percent of the officers we have targeted.

For new college graduates, our main leverage is offering incentives, such as signing bonuses. But our successful hiring is largely attributable to our warfare centers/labs all around the country, as representatives there have personal interaction and investments in the local community. They are able to get out in their communities and inform the public of the exciting work the Department of Navy has to offer and to inspire folks to consider a civilian technical or business career supporting the men and women of the Navy/Marine Corps team. Additionally, our warfare centers/labs have a multitude of outreach efforts to attract college students. In fact, many of our scientists and engineers also teach at local colleges or community college campuses. Additionally, our warfare centers and labs offer scholarships to local students at nearby college campuses and community colleges.

As we craft our intern programs, we must ensure mentorship opportunities, access to lessons learned, and new opportunities are incorporated into the programs so our new talent will have a solid foundation in order to develop into future Army leaders.

But the best incentive was described by noted naval scientist, Dr. James Colvard: "Challenging work attracts people, and pride in their output retains them." The Navy and its labs enabled great innovations like the laser, fiber optics, GPS, and others that have literally changed the world. Many people want to be a part of that; they want to have an impact. They also seek something else. As a recently hired computer scientist at a naval warfare center in Charleston, S.C., stated, she was "looking to serve the warfighter and my country." So we are working diligently to remain engaged in our local communities and remind them of the exciting work that is available in the Navy.

Shackelford

The Air Force is using a corporate recruitment strategy targeted to ensure the right talent applies for available acquisition positions. We've partnered with the Office of Personnel Management and the Air Force Personnel Center to create an employment brand, recruitment materials, and Web site; to create concise, easily understood, and user-friendly vacancy announcements, and streamlined assessments and certification for our featured vacancies. We've established strategic recruiters at each acquisition center, who, in conjunction with their senior acquisition functionals, have overall responsibility for local recruitment plans, activities, and events to target highly qualified candidates. We're seeking

diverse quality talent using external recruitment sources tailored to the types and levels of the positions. That includes searching for qualified job seekers through professional and community outreach to colleges and universities, professional organizations, alumni associations, career-building organizations, professional conferences, non-federal employment sites, job fairs, contractor-to-civilian conversions, transition centers for separating and retired military, employment agencies, and employee referrals. We're using the full range of recruitment and retention flexibilities such as recruitment, relocation, and retention incentives; student loan repayment; work-life programs such as alternate work schedules, transportation subsidies, fitness programs, and tuition assistance; and available pay-setting flexibilities.

Thanks to the recent expedited hiring authority in the fiscal year 2009 NDAA, we've been able to streamline the hiring process for all acquisition functional positions at the mid- and senior-level. The Air Force goal is to make an offer within one pay period after the receipt of the request for personnel action. Compared to what had been a months-long process, this is a notable improvement that enables us to hire highly qualified individuals quickly. We continue to use individual and open continuous internal and external vacancy announcements to attract internal Air Force candidates, other current federal employees, veterans, and other noncompetitive appointment eligibles.

Q

How is your military service working to prevent the brain drain that is threatening DoD? What processes are being established to ensure that knowledge of retiring workers isn't lost, and that there are people who can take the place of those retiring?

Thompson

With the infusion of Section 852 funding, we are now able to hire more intern- and journeyman-level employees. That provides us the opportunity to ensure new personnel will be mentored by our knowledgeable acquisition professionals. As we craft our intern programs, we must ensure mentorship opportunities, access to lessons learned, and new opportunities are incorporated into the programs so our new talent will have a solid foundation in order to develop into future Army leaders. Our retention incentives may also help to prevent our trained interns from leaving the government for industry positions. Our recruitment efforts have included roadshows at colleges and high schools to encourage students to consider future employment with the Army acquisition community. Our organizations are also developing implementation plans for knowledge management in conjunction with the principles of the Army chief of staff's guidance on knowledge management. This and our focus on knowledge transfer and continuous education learning will be instrumental in our knowledge retention efforts. The importance of continuous learning is stressed for current employees at all levels, and Army activities across the country are hosting knowledge-sharing events: cross-training, job-shadowing, brown bag training sessions, and roundtable discussion groups with knowledgeable acquisition leaders on key acquisition topics. Those and other activities will ensure the continued growth of our current acquisition workforce into our future leaders.

Thomsen

The Department of the Navy has very specialized technical expertise that it can't afford to lose. As I've said before, we have a very high-tech Navy. We have some of the most enticing, complex engineering challenges. For example, the systems integration and complexity of an aircraft carrier is enormous. It is, arguably, the most complex man-made system in the world—5,000 people on-board, an airwing, two nuclear reactors, integrated network operations, all moving briskly on the ocean to meet a number of different missions. Developing new concepts for these complex systems typically requires much more than a fresh-out-of-college graduate with an engineering or science degree; rather, we need experienced and talented engineers, information technology, logisticians, and people with excellent business skills to assist in the acquisition and contracting functions.

We are doing several things to ensure such specialized knowledge is retained and passed on to the next generation. For example, we're providing retention bonuses to personnel in areas where we would be especially vulnerable if they left. Use of such funds is authorized under Section 852. Those bonuses have enabled us to keep key personnel onboard for another year or two, allowing them to mentor new personnel. That's been very helpful. Another thing we are using is the Retired Annuitant Program, which allows us to bring back retired individuals to mentor employees in a particular area or expertise.

We are also using the Highly Qualified Expert Program, which Congress authorized in 2004. It allows us to bring on personnel who can provide mentorship and senior executive capabilities in areas where we are particularly weak or where we have lost folks who are very difficult to replace. Those programs have helped us preserve and pass on expertise before it is lost. But again, what is critical to keeping and getting quality personnel is quality work. That is why we have asked our program executive officers to assign a deliberate measure of hands-on work to our Navy technical labs/warfare centers.

Shackelford

This issue highlights the fact that acquisition excellence requires more than book learning; it relies on acquisition savvy that only experience can bring. We've made knowledge transfer a primary purpose of our Section 852 journeymen hiring program, which was designed to bring experienced acquisition personnel into the workforce as "overhires" in anticipation of vacancies due to separations or retirements. One example of a resource we plan to exploit is separating acquisition officers. We're reconstituting a program to solicit

their interest in civilian Air Force acquisition employment opportunities and connect them to hiring offices at their preferred employment locations. Coupled with our strong entry-level hiring programs and the Air Force's "deliberate development" philosophy using career field development teams, we're working to ensure orderly knowledge transfer as experienced members leave the acquisition workforce.

Q

How is your military service working to ensure that there is a steady pipeline of program managers who have the training and experience necessary to oversee DoD acquisition programs?

Thompson

We're using a holistic and comprehensive approach to prepare program managers through our education, training, and career development programs. One specific career development program offered to our Army acquisition workforce members is the Competitive Development Group/Army Acquisition Fellowship (CDG/AAF) Program. This is a feeder group for future senior leadership positions within the Army Acquisition Corps, and the three-year leadership development program provides leadership opportunities in the form of developmental assignments within PEO/PM offices as well as carefully selected leadership courses to enhance the fellows' leadership skills. Developmental assignments range from serving as assistant product/project manager to the Department of the Army; as a systems coordinator for a PEO in the Office of the Assistant Secretary of the Army for Acquisition, Logistics and Technology; to a deputy product/project manager. CDG/AAF fellows assigned to the PM track apply for the acquisition key billet lieutenant colonel/GS-14 product manager board in the second and third years of their CDG/AAF program. I am pleased to share that we have 5 CDG/AAF fellows selected as alternates to the 2010 Product Manager Command Select List. In addition, most of our civilian PMs were graduates of the CDG/AAF Program. When a project or product manager is assigned to a program management office, the Acquisition Management Branch, U.S. Army Human Resources Command begins planning for the mandatory DAU training and pre-command course requirements.

Thomsen

We actively manage our military acquisition workforce career paths, which is also of particular interest to Congress. We have found that the Department of the Navy's acquisition leadership is most effective when staffed with a calibrated mix of warfare community personnel. Additionally over the last two years, we have revised some community career paths to meet anticipated shortfalls in critical acquisition positions.

On a similar note, the Marine Corps has established a military occupational specialty for acquisition management, with 114 officers in this specialty, which currently includes two general officers: commander of Marine Corps Systems Command and the Joint Strike Fighter PEO. Typically, officers in the specialty are assigned to acquisition leadership positions in programs for ground equipment and/or weapons systems programs, which prepares them for program management and executive officer assignments.

On the Navy side, uniformed program managers are drawn from staff corps, restricted and unrestricted line officer communities. The Supply Corps and restricted line officer communities—engineering duty officers, aerospace engineering duty officers, and aerospace maintenance duty officers—have been very effective in ensuring a deliberate career path, yielding highly experienced and qualified acquisition professionals. Supply Corps and engineering duty officers, in particular, work in acquisition early in their careers.

It's a little bit more challenging for Navy unrestricted line officers, coming from the aviation, surface, and submarine communities. Their career paths are very busy with operational demands, making it challenging to assign them to acquisition billets early in their careers. We continue to adjust the career paths and opportunities by working through the three-star community managers. The naval aviation unrestricted line officers community, for example, has recently refined its acquisition career path so that aviators can be assigned to an acquisition career path earlier in their careers. Last year, the surface warfare community similarly adjusted its career path.

Shackelford

Our acquisition specialties, including acquisition management, deliberately develop acquisition professionals according to well-defined career path models that serve as a guide for developing both military officers and civilians through assignments, education, and training. These career models define career paths to greater rank and responsibility within the acquisition workforce. The development of acquisition workforce members is enhanced by the use of career field development teams consisting of senior leadership from within each acquisition career field. Using the published acquisition career path models as a guide, the acquisition development teams provide each individual with developmental guidance that vectors them on paths of progression and opportunity in the acquisition workforce. The development teams also nominate officers and civilians for service schools (developmental education), and identify military candidates for command leadership positions within the acquisition workforce. The Air Force also has well-established career field management and force development functional responsibilities at the Headquarters, Air Staff level to provide strategic direction to the career fields and oversight of the developmental team process.

Q

Can you talk about current and future leadership development programs of your military service? How are GS-15s and SESes,

and their military equivalents, gaining the experience necessary to do their jobs?

Thompson

In an effort to provide a leadership development program for our Army Acquisition Corps members at the GS-14/15 or equivalent rank, the Army Acquisition Corps instituted a pilot Senior Service College Fellowship Program for our high-performing GS-14/15 Army Acquisition Corps members in 2006 in Huntsville, Ala. Since then, we have expanded the program to Warren, Mich., and will soon be implementing one at Aberdeen Proving Ground, Md. The SSCF program provides leadership and acquisition training and has an excellent mentoring program. Individuals who complete the program are awarded equivalency for the DAU Program Managers Course (PMT 401) and are given the option to complete a master's degree. The SSCF program emphasizes leadership in acquisition with core elements in leadership, research, program management, and mentoring. Senior leaders at each of their locations place the graduates in key acquisition positions after completion of the SSCF program.

Acquisition is about 40 percent of an exceedingly tight Navy Department budget. When acquisition programs deliver on time and on budget, that means that we don't have to pull money out of some other already tight account to pay for cost overruns.

Our military officers and civilian equivalents also compete for and attend other Senior Service Colleges, such as the Industrial College of the Armed Forces and the Army War College. ICAF prepares officers and civilians for senior leadership and staff positions. They are offered a wide choice of research and elective opportunities, and also follow a common core curriculum and two mandatory advanced studies in acquisition policy courses. While separate attention is given to acquisition coursework, students have the benefits of mingling with other students from the operational and other functional communities. We are allocated seven acquisition seats each year for senior-level GS-14s and above. Graduates receive a master's degree in national security strategic studies and also fulfill the Office of Personnel Management's Senior Executive Service core competencies. ICAF graduates are placed in key leadership positions after graduation.

The Army War College prepares officers and civilians for leadership responsibilities in a strategic security environment during peacetime and wartime. The college emphasizes theory, concepts, systems, and the national security decision-making process—all of which prepares senior military officers and civilians for key leadership and staff positions.

Our senior-level Army Acquisition Corps members also participate in my Executive Leadership Program Team Learning Event, in which key leaders in the Army come together twice a year to discuss major issues impacting the workforce. The event is by invitation only and includes high-performing GS-15s/equivalents and promotable colonels.

Other programs—such as the Harvard Program for Senior Executive Fellows and the Federal Executive Institute's Leadership for the Democratic Society—are leadership opportunities for our senior-level staff. The Senior Executive Fellows program builds executive skills in political and public management, negotiation, human resources and management, organizational strategy, and leadership. The Federal Execu-

tive Institute program focuses on personal leadership, organizational transformation, policy, and global perspectives.

Another effort within our contracting career program offers our senior Army contracting and acquisition professionals in the grades of GS-14/15 or equivalents the opportunity to apply for the Senior Leadership Development Program, which is a feeder group to the Senior Executive Service. The program develops core leadership competencies and extends over an 18-month period, alternating learning between the classroom and on-the-job experiences. The classroom component consists of three one-week residential sessions. The learning activities outside the classroom involve a mix of individual work and small group work. The on-the-job component includes a mentor, a faculty coach, developmental assignments, team projects, leadership forums, field experiences, focused reading, and Web-based learning.

Shackelford

Our acquisition process improvements depend on continuity of leadership, and we've made succession planning across the acquisition enterprise a key objective of our human capital strategic plan. A precept of DAWIA is to develop a strong pool of qualified, talented candidates from which to choose leadership successors. Our Force Development Teams are key tools in the deliberate development of competencies and leadership experience to meet future leadership needs. As needed, we're investing in career broadening and mobility incentives, including through the use of Section 852 funding. In addition, based on competency requirements, we're investing in cross-functional certification training, acquisition leadership training, and executive-level acquisition training.

Q

Mr. Thomsen, can you explain what role the Department of Navy's labs and warfare centers play in the future of the Navy's acquisition workforce?

Thomsen

The importance of our warfare centers/labs was stated by Supreme Allied Commander, Europe and Commander, U.S. European Command Adm. James Stavridis: "We will win—or lose—the next series of wars in our nation's laboratories."

Our warfare centers/labs were founded to institutionalize innovation for our naval forces—to know how to apply technology to fleet needs—because technology readily translates into naval operating advantage. The centers/labs interpret military requirements in terms of technology, develop potential approaches to meeting those needs, and validate proposed solutions. Their role is not to produce the final product, but to understand the underlying science and engineering and determine its viability.

In keeping with this role, warfare centers/labs can help the Department of the Navy reclaim that technology and cost-trade space that I mentioned, particularly prior to Milestone B. They are ideally suited to support program offices by understanding the technical merits of a proposed system. Additionally, per a Sept. 19, 2007, USD(AT&L) memorandum systems- and subsystems-level prototyping must be done to inform Milestone B to reduce technical risk, validate designs, validate cost estimates, evaluate manufacturing processes, and refine requirements. It is a role warfare centers/labs can do by teaming and working with industry.

Naval system commands and warfare centers/labs play a critical role in complex system development. This is particularly the case with open architectures, a principal tenet of new naval systems development. As the Department of the Navy produces future system specifications, in-house engineering teams will need to manage standard interfaces in the reference architectures. And as the Department of the Navy transitions to become its own lead system integrator (as directed by Congress), warfare centers/labs will provide critical engineering expertise to program managers.

Additionally, warfare centers/labs will continue to be called upon to meet emerging needs. When U.S. forces needed to quickly root out Al Qaeda and Taliban fighters in Afghan caves in 2001, it was the naval warfare centers/labs that helped field in 60 days a thermobaric bomb, producing devastating pressures in deep and winding tunnels.

Lastly, the warfare centers/labs must scout the scientific horizon for knowledge that may be translated into future technological advantages. While the previously mentioned thermobaric bomb was fielded in 60 days, the warfare center/lab began its underlying research 35 years before that. The need for labs to anticipate future challenges and needs was recently pointed out in the previously mentioned Center for Naval Analysis study: "The uncertain demands in an era of international terrorism require a focus on intellectual capabilities across the technical infrastructure of the Navy."

We also have some concerns that industry is increasingly less likely to make risky investments in innovation and technology that is applicable to military use. The defense industry will continue to invest, but there has been a steady consolidation of the defense industry, which results in less competition, less risk-taking, and less innovation. We believe we must make an informed and measured investment in our own technical infrastructure to remain a partner and peer of industry that secures our own future.

Q

"The conventional DoD acquisition process is too long and too cumbersome to fit the needs of many systems that require continuous changes and upgrades," according to a recent Defense Science Board report. Lt. Gen. Shackelford, can you discuss processes that are being developed to shorten the acquisition process, and how will the Air Force ensure its people are positioned and trained to improve acquisition processes?

Shackelford

The Air Force is pursuing multiple initiatives to improve the acquisition enterprise. The Acquisition Improvement Plan, recently signed by the secretary of the Air Force and the chief of staff of the Air Force, outlines five broad initiatives and details multiple action items within each initiative.

One AIP action intended to shorten the acquisition process requires program managers to develop incremental acquisition strategies that reduce cost, schedules, and technical risk and produce operational capability earlier. Incremental acquisition strategies that deliver early, if only partial, operational capability will be pursued, rather than strategies that deliver the 100-percent solution; the 100-percent solution is often too costly, takes too long to deliver, or involves schedule and performance risks that are too high. The warfighter and acquisition community must work together to resist the temptation to pursue high-risk requirements that are too costly and take too long to deliver in favor of an incremental acquisition strategy that delivers most of the requirements in the initial increment and additional improvements added as technology matures.

Our acquisition human capital strategic plan includes a focus on initiatives to attract, select, develop, and foster talent with the competencies we need to do the current and future acquisition mission.

A second AIP initiative freezes program requirements at contract award and requires subsequent changes to be accompanied with adequate funding and schedule considerations that are reviewed and agreed upon by the appropriate requirements authority. Requirements must also be acquisition-friendly and produced in a format that is readily adaptable for use during source selection and throughout the acquisition process. Clearly defined requirements that are developed with the assistance of the acquisition community, and freezing program requirements at contract award (reducing requirements creep) should lead to earlier delivery of capability into the user's hands.

The Air Force is also focusing on improving the quality and sufficiency of early technical planning. The acquisition team must be involved early in the requirements tradeoff decision process, with experienced systems engineers to help guide the requirements community in this complex process. The technical merits (for example, military utility) of candidate solutions are still being evaluated in the analysis of alternatives. It is important to also recognize that the majority of requirements might be satisfied at a lower cost using alternative approaches, so trade-space options are critical and must be understood. Acquisition involvement earlier in the Air Force requirements development process and systems engineering techniques will be applied to assist in the tradeoffs that occur as part of the process. The Air Force has increased funding for early (pre-program) systems engineering and technical planning in a new program element for requirements analysis and maturation. This activity is also known as development planning and includes comprehending future capability needs, evaluating alternate concepts, assessing technology maturation approaches/risks and life cycle costs, and formulating executable acquisition strategies. By working closely and collaboratively with the requirements stakeholders, we will ensure that the initial risk assessments presented to decision makers clearly detail how an emerging concept improves the ability to perform the operational mission in the desired time horizon. As the concept definition solidifies, the risk assessments will address specific technology maturation and programmatic issues associated with development, integration, and testing of critical technologies and system elements.

The Air Force is establishing an integrated research, development, and engineering policy framework to ensure the accomplishment of this upfront technical planning to initiate programs successfully. We are charging our practitio-

ner community to operate with a total life cycle engineering focus; to identify cost, schedule, and performance risk areas before making program launch decisions; and to communicate cost and schedule confidence levels throughout the early stages of the acquisition process, thereby improving our ability to manage requirements and avoid disconnects. This early effort helps the Air Force reduce program risks, and we will be far more confident that our future programs will deliver more increments of desired capability on shorter and more realistic schedules at closer to expected cost.

Q

Sue Payton, the former Assistant Secretary of the Air Force for Acquisition, has recently redesignated the Air Force Center of Excellence as the Program Management and Acquisition Excellence Office and made it a direct report to the service acquisition executive. Lt. Gen. Shackelford, can you discuss the reasoning behind the decision, and what it means for Air Force acquisitions?

Shackelford

The Program Management and Acquisition Excellence office was created with the idea of providing both a focus on program management and expanding on Air Force acquisition excellence initiatives. The first efforts of the new PM&AE are to work with the Air Force's acquisition leadership to reset its acquisition processes, ensure adequate and continuous training of its acquisition professionals, and return to a back-to-basics approach in managing programs.

Many independent studies—GAO, RAND, Center for Naval Analysis, and others—have identified problems with unclear guidance, lack of expert advice, lack of tools and adequate processes, and failure to capture lessons learned. To resolve those problems PM&AE will serve as lead agent responsible for identifying, developing, and deploying standardized program management practices—such as source selection training, risk management, integrated baseline development, and schedule development and analysis—across the acquisition enterprise. They will also work to ensure all acquisition guidance is clear, concise, and non-duplicative in nature prior to release by the service acquisition executives or other functional directors. PM&AE provides program managers a single source for expert advice on implementing all acquisition guidance (law, regulation, policy, directives, and mandates) and ensures feedback and recommendations from program managers for revisions and improvements to acquisition guidance and best practices are communicated to the policy makers. This will promote improvements in the acquisition process, help employ lessons learned, reduce cycle time, and aid in crafting effective acquisition strategies.

The Defense Acquisition Performance Assessment Report and Congress in the fiscal year 2007 NDAA indicated the need for enhanced training for program managers and emphasized mentoring of program managers by experienced senior executives and former program managers. With this goal in mind, PM&AE has also established a working group to develop an approach to train and facilitate program management teams by providing senior advisors who offer hands-on, dedicated subject matter expertise.

PM&AE will continue its job as the secretariat for acquisition strategy panels, Air Force review boards, and configuration steering boards. It will also continue to advise the Air Force SAEs for space and non-space acquisition programs and the acquisition community. In keeping with the department's Acquisition Improvement Program to strengthen acquisition, PM&AE—at the headquarters and at field levels—will continue to leverage their collective talent to provide support to the PEOs, designated acquisition officials, and program managers and their teams.

Q

Are there any other issues you would like to discuss with our readers?

Thompson

First, we have an emphasis on people. People are our greatest asset. We have designed our acquisition education and training efforts to ensure our people are the best of the best. Our Section 852 programs were designed with emphasis on the recruitment, retention, and recognition of our workforce. A key ASA(ALT) strategic objective is to shape a high-performing acquisition workforce. We do that, as I have discussed previously, through our Acquisition Education, Training and Experience Program opportunities and with the functional training offered by the DAU. The Army, other military services, and DoD agencies support DAU in the development of course curricula and explore and develop training on topics that ensure our acquisition workforce has the best information and tools available. DAU also offers several hundred online continuous learning modules that provide the Army acquisition professional with ready and accurate training on topics that have an immediate impact upon their daily operations. Additionally, DAU's rapid-deployment training initiative quickly pushes important acquisition information and related policy changes out to the workforce. This information is immediately accessible to Army acquisition workforce members located worldwide so that informed business and program decisions can be made around the clock.

The Army acquisition executive strongly encourages recognition of acquisition excellence throughout the community. Each year, we personally recognize Army acquisition workforce individuals and teams whose performance and contributions set them apart from their peers. The awards conveyed each year directly reflect the workforce member's outstanding achievements in support of the soldier and the Army's business transformation efforts. Award categories include the Secretary of the Army Project and Product Manager and Acquisition Director of the Year Awards, the

ASA(ALT) Contracting Noncommissioned Officer Award for Contracting Excellence, the Army Life Cycle Logistician of the Year Award, and the Secretary of the Army Excellence in Contracting Awards. The Army also supports DoD's David Packard Excellence in Acquisition Award, which recognizes groups and teams who have made significant contributions or demonstrated exemplary innovations and best practices in the defense acquisition process.

Regarding acquisition reform and insourcing of the acquisition workforce, the secretary of defense in his Defense Budget Recommendation Statement of April 6, 2009, stated that providing realistic estimates of program costs, providing budget stability for the programs, adequately staffing the government acquisition team, and providing disciplined and constant oversight are critical elements of acquisition reform. His statement also indicated that growth of the workforce would occur through insourcing acquisition services and hiring more government acquisition professionals. The intent is to significantly improve the capability and capacity of the defense acquisition workforce. Bottom line: We need to be smart buyers for the government.

The Army has a plan to grow our workforce, and currently, the exact growth details per acquisition career field are being finalized within our acquisition functional communities.

Lastly, I want to mention that the U.S. Army is considered a great place to work in the federal government in the Best Places to Work in the Federal Government report, a survey document published biennially by the Partnership for Public Service. Specifically, the U.S. Army Acquisition Support Center, where our PEOs as well as the ASA(ALT) headquarters reside, ranked number 32 out of 216 organizations surveyed. Designed to help a broad audience of job seekers, researchers, federal employees, and government leaders, the Partnership for Public Service and the American University's Institute for the Study of Public Policy Implementation obtained responses from more than 212,000 civil servants to produce detailed rankings of employee satisfaction and commitment across 279 federal agencies and subcomponents. They used data from OPM's federal human capital survey to rank agencies and subcomponents. Agencies and subcomponents are ranked on a best-places-to-work index score that measures overall employee satisfaction, an important part of employee engagement. The score is calculated both for the organization as a whole and also for specific demographic groups. The Army is proud to be noted in this publication and, within the Army Acquisition Corps, we strive for success of our programs and processes to ensure we continue to provide a great place to work.

Thomsen

The things I've talked about and other related initiatives have profound implications for the naval services and beyond. The initiatives will improve the naval acquisition workforce's business practices and technical oversight of acquisition. Moreover, this improved oversight will better ensure that our sailors and Marines on the pointy end get the systems they need and they work when called upon.

But it means more for sailors, Marines, and even their families. Acquisition is about 40 percent of an exceedingly tight Department of the Navy budget. When acquisition programs deliver on time and on budget, that means that we don't have to pull money out of some other already tight account to pay for cost overruns. Thus, funds intended for military facilities, military housing, or health care, for example, are available for just that.

These initiatives are also important to industry. Companies have repeatedly said they want a government acquisition workforce that possesses the business and technical knowledge to help them work through the issues that arise daily. Without that government peer, industry is left to address the tough problems unilaterally. Moreover, companies want to come in on time and on budget. They want to succeed just like we all do. It's good for business.

But above all these initiatives is our responsibility to the American taxpayers. They want us to be good stewards of their tax dollars, especially in these times—and that makes improving our acquisition workforce the right thing to do.

Shackelford

Air Force leadership is constantly looking for ways to alleviate burdens facing our acquisition program offices. Two initiatives to reduce the burden are the Integrated Life Cycle Management Policy effort and the Joint Independent Program Review and Assessment process. The first effort has already collapsed 35 different Air Force policies and guides into three policy documents. The creation of these enterprise policy documents allows understanding of early decisions across the systems life cycle and also has the added benefit of making it faster and easier for program personnel to find the guidance they need by reducing unnecessary, redundant, potentially conflicting information.

The Joint Independent Program Review and Assessment effort works to alleviate burdens associated with the sheer number of program reviews and assessments. Working closely with the Office of the Secretary of Defense, the effort synchronizes parallel review activities under a single framework. It also includes identification of risks, particularly in areas related to the integration of new technologies. The current Joint Independent Program Review and Assessment effort focuses on technical planning, but future initiatives will incorporate cost and schedule activities leading towards a fully integrated program assessment.

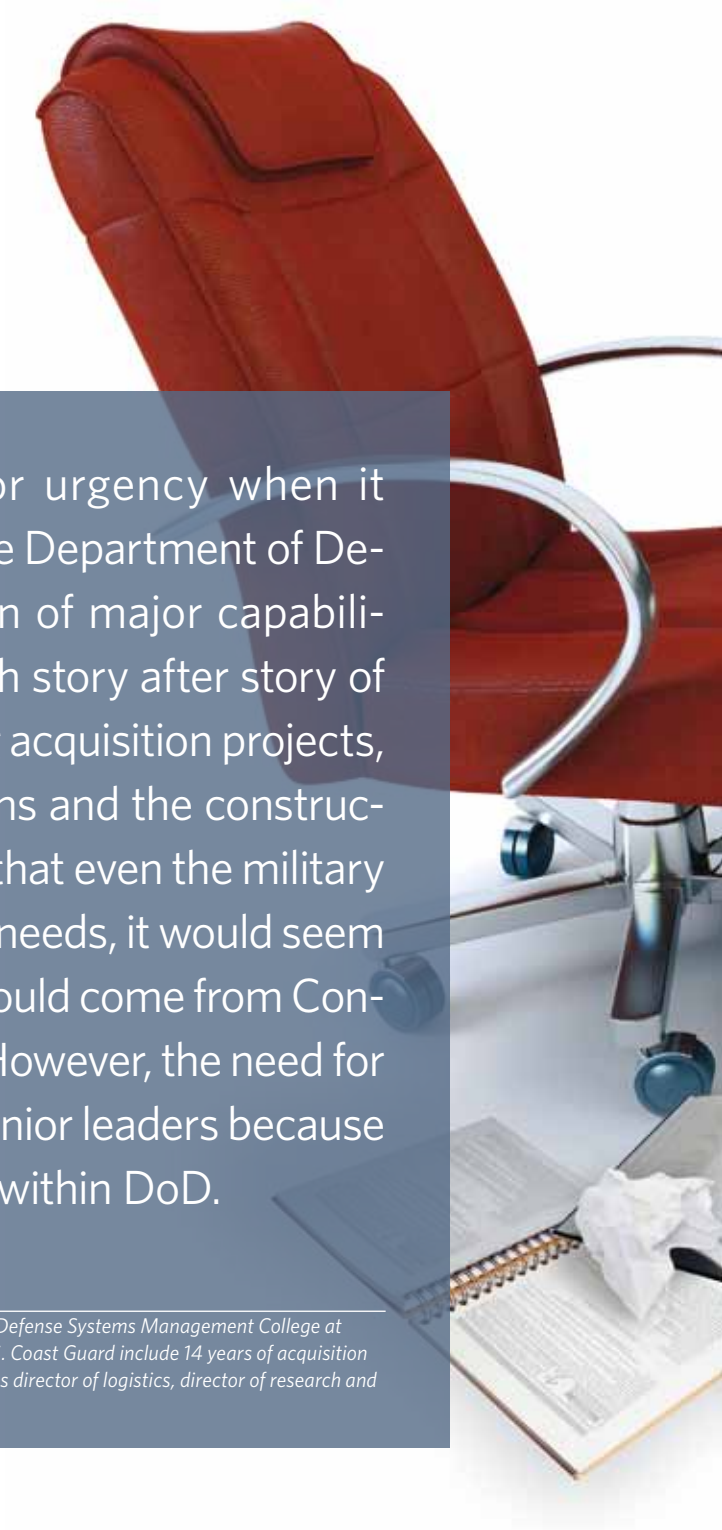
Q

Thank you all very much for your time.

Let's Fix It

A Five-Step Plan for Improving Acquisitions

Scott Reynolds



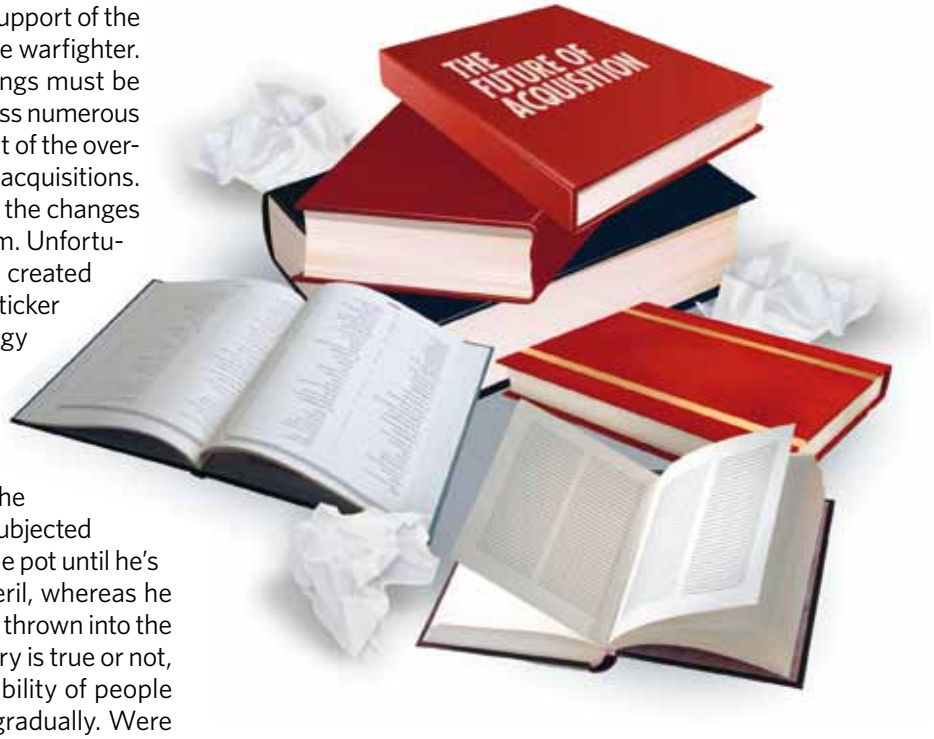
Building a case for urgency when it comes to fixing the Department of Defense's acquisition of major capabilities is simple. With story after story of bloated and failing acquisition projects, cost overruns in the billions and the construction of weapons systems that even the military says it no longer wants or needs, it would seem that urgency for reform would come from Congress and the taxpayers. However, the need for urgency is often lost on senior leaders because of the culture we nurture within DoD.

Reynolds *is a professor of program management for the Defense Systems Management College at the Defense Acquisition University. His 26 years in the U.S. Coast Guard include 14 years of acquisition and program management experience, including serving as director of logistics, director of research and development, and deputy CIO.*


THE FUTURE OF ACQUISITION

While I use the phrase "fixing DoD acquisition," senior management would be keen to use the word "improving" rather than "fixing." Such a propensity for softening problems and subsequently blunting the urgency necessary to correct them is also quite prevalent in the 100-plus studies that have been conducted to understand and recommend "improvements" for DoD acquisitions. Reports typically begin with an acknowledgment of the superiority of DoD's weapons systems, so as not to insult those who make it their life's work to toil away in support of the acquisition and delivery of capabilities to the warfighter. Therefore, the reports postulate, many things must be going right; and as the reports go on to discuss numerous things going wrong, they do so in the context of the overarching success that surely embodies DoD acquisitions. The reports have thousands of pages citing the changes that need to be made to improve the system. Unfortunately, the sense of urgency that should be created by such reports gets lost in DoD's bumper-sticker slogan that declares "Our military technology is the envy of the world."

It is past time to bring credibility back to DoD acquisitions by simply delivering what we promise.



Into the Boiling Pot

We are seeing the slow accumulation of reported problems, invoking images of the slowly boiled frog. According to lore, a frog subjected to slowly rising temperature will remain in the pot until he's boiled, never sensing the urgency of his peril, whereas he would immediately try to jump out if he was thrown into the pot already at full boil. Whether the frog story is true or not, it is often useful as a metaphor for the inability of people to react to important changes that occur gradually. Were America's weapons systems not the envy of the world, and were Congress and taxpayers not already numb to a gradually growing body of evidence that DoD acquisitions "needs improvement," you can bet somebody would be screaming and jumping out of this boiling pot.

The reality is we outspend our next closest competitor by more than 2-to-1 when acquiring defense capabilities. Such unconstrained spending cannot be sustained at a time when pressing deficits mean DoD's budget will—at best—see no growth during the next five to 10 years. Even a stable budget will force the administration and the public to forego other spending priorities in the name of maintaining our defense preeminence. Remember, it's widely accepted that the Soviet Union fell as much from an inability to economically sustain its arms race with the United States as it did from the urgings of a U.S. president to "tear down those walls."

Challenges of Maintaining the Pace

As DoD attempts to grow by 91,000 troops, the department will have far less money to spend on acquiring the technologies for which the United States is so greatly admired. The last time we saw a similar drawdown in defense spending was after World War II. At the conclusion of that war, however, we had built our industrial base to an unprecedented level; our troops were already outfitted with new planes, vehicles, and ships; and our closest competitors' economies and infrastructures were literally in ruins. We simply didn't need to purchase new assets and capabilities to maintain military dominance in that post-war era. Additionally, World War II helped us emerge from the Great Depression, and our economy was about to enter a period of sustained growth.

Today, we have tankers and fighters operating past their predicted lifespan; we have worn-out or the wrong type of vehicles for the Army and Marines; our Navy is working with an aging fleet in need of major repairs or complete replacement; and our economy is in the midst of its worst downturn since the Great Depression. It is both important and urgent that we start being the envy of the world for the efficiency at which we buy the best technologies and not just for the size of our wallet. Sustaining military preeminence through a 2-to-1 ratio of spending is not only bad business; it may ultimately jeopardize our world leadership position.

Change is Easy

Instead of appeasing our dedicated workforce with words of praise and condescension, let's help them by creating an

environment that gives them a chance to be efficient and effective. Unfortunately, most of the reports that suggest improvements for DoD acquisition methods also suggest that those changes are difficult to impossible to implement. I disagree.

Italian economist Vilfredo Pareto observed in 1906 that 80 percent of the land in Italy was owned by 20 percent of the population. Since that revelation, his observation has shown itself to be a useful mathematical rule of thumb for many of life's problems and mysteries, being known colloquially as the 80/20 rule. I believe the simple and actionable solutions recommended by others—and restated in this article—would resolve 80 percent of the problems we face today in DoD acquisitions. The steps in this article are not steps that I've developed; rather, they are common sense changes that have been suggested in countless studies. The only barrier to their implementation is one of resolution, will, and a much-needed sense of urgency. Even when viewed in total, these simple steps do not constitute acquisition reform, but rather, they provide an opportunity for our acquisition workforce to perform in the manner in which they have been trained.

Don't Reform Policy

My first recommendation is to avoid the temptation to reform. Shortly before John Young, a person I greatly admire, stepped down as under secretary of defense for acquisition, technology and logistics, he issued new policy on how to conduct DoD acquisitions (DoD Policy 5000.02, <https://acc.dau.mil/dag500002>). The policy was meant to correct the shortcomings the under secretary had observed during his tenure, and it was part of his legacy. Less than 24 hours after he signed the new policy, I was e-mailed an animated Microsoft® PowerPoint presentation, set to the music of *The Nutcracker Suite*, showing how the new policy was merely old policy issued with new terms. It was both amusing and sad. Before the day was done, I had received five other versions of that presentation. Firm fixed-price contracts for development? Been there. Placing an emphasis on systems engineering and accountability? Done that.

In the Feb. 9 issue of *Defense News*, Massachusetts Institute of Technology Professor of Public Policy and Organization Harvey Sapolsky authored an article entitled "Let's Skip Acquisition Reform This Time." In his article, Sapolsky noted, "The limited number of available reforms have all been recycled. You can centralize or decentralize. You can create a specialist acquisition corps or you can outsource their tasks. You can fly before you buy or you can buy before you fly. Another blue-ribbon study, more legislation and a new slogan will not make it happen."

In his book *Knowledge for Action: A Guide to Overcoming Barriers to Organizational Change*, Dr. Chris Argyris explains that large organizations like DoD use policy changes and reorganizations as defensive mechanisms to avoid embarrassment. Argyris notes that even the best-intentioned leaders tend toward such behavior. As a result, organizations often fail to create workable solutions, and instead, create policies that hinder true learning and improved performance. The November 2005 Government Accountability Office Report 06-110 highlights that it is not the absence of DoD policy but the failure of DoD to follow its own policy that causes most program problems. In addition, the January 2006 Defense Acquisition Performance Assessment Report suggests the lack of trust throughout the entire acquisition process has placed too heavy a policy burden on those few folks actually responsible for delivering a new capability.

We need to resist the urge to tinker with and add new policy requirements. However, even as this article is being written, DoD is establishing the Office of the Director of Cost Evaluation and Program Evaluation to improve cost estimates in response to all the embarrassing press DoD has received on its cost estimating processes. (I'll discuss cost estimates later in this article.) The new office will grow and do what staffs do: create lots of new policy. Such action is exactly the failed response to problems that Argyris says is typical of large organizations.

To quote Gen. George S. Patton, "A good plan violently executed is better than a perfect plan executed next week." DoD acquisition doesn't lack good policy; and building more or revising what we have is only a distraction from what is really needed, which is an emphasis on strong performance and how to attain it.

Use Independent Cost Estimates

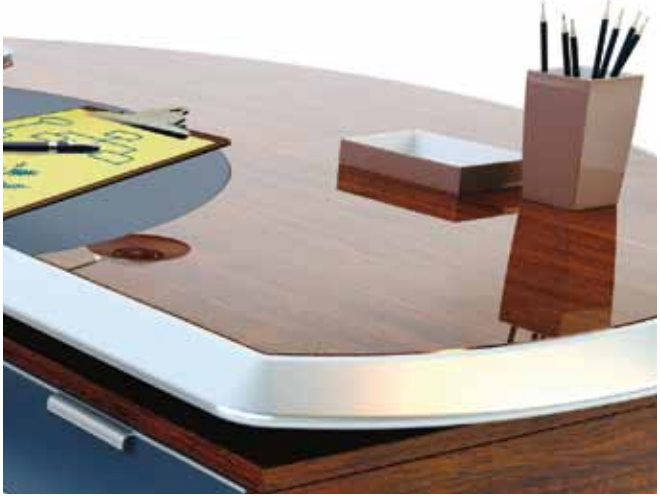
My second recommendation is to fund programs to their independent cost estimate. The July 2008 GAO Report 08-619 stated that of the 20 major programs they studied, 75 percent were not funded even to DoD's most optimistic cost estimate, despite DoD's stated policy to fully fund programs. Let me explain. All major acquisition programs have at least two program cost estimates: the program's internally developed estimate; and an independent, outside estimate. The internally generated estimates are typically much lower than the independent estimates, and therefore, they are easier to sell to Congress. But GAO found that DoD failed to budget enough funds to meet even the program's optimistic cost estimate. In November 2005, GAO reported that DoD program managers considered funding instability and shortfalls their biggest obstacle to success.

Why is adequate funding up front so important? By underfunding a program at the outset, the department establishes a culture of dishonesty. DoD needs funding approval from Congress, so the department reports the most palatable cost-estimate number. Contractors bidding on the program look at projected funding levels and ensure they come in under those numbers to win the business. The

government needs the contractors to creatively present their finances to get the contract awarded and the program under way. A shared lie is created. As one would expect, when programs are under-funded from the start, negative progress reports are generated very early on. Pressure immediately rises, and the partnership of those complicit in the lie is quickly tested. The contractors and the government PMs are incentivized to keep a positive spin on budgeting as long as possible—at least until enough time and money have been invested that the program has a life beyond good business sense. The PM and contractor are now adrift in the same lifeboat, hoping there is enough food and water to survive until they can be rescued by a budget increase. While the invested funds are indeed a sunk cost, the psychological reality is that we have spent too much to just walk away. Eventually, there's only enough food and water in the lifeboat for one of the partners to survive, so schemes develop to throw each other overboard. In some cases, the government conveniently forgets the shared lie and, to save the program, criticizes the industry partner for failing to deliver. The industry partner points to poorly defined or creeping requirements. The industry/government partnerships quickly dissolve into contract language discussions instead of product delivery efforts.

We don't need further analysis on this issue or better cost estimates; we simply have to use the information we already have in hand and begin funding programs to their independent cost estimates. Not only will this resolve our PMs' number one problem, but it can preserve the moral high ground that we should expect all government PMs and industry partners to stand upon.

Firm fixed-price contracts for development? Been there. Placing an emphasis on systems engineering and accountability? Done that.



Leadership Continuity

My third recommendation is to assign great leaders and keep them there. As Terry Little, a recognized acquisition expert with more than 25 years of experience leading major weapons programs, said in his March 2006 testimony to House Armed Service Committee, "At its very core, this acquisition business is not about contracts, testing, acquisition strategies, plans, technology, finance, oversight, or any of the other things one can learn about or make rules about. It's about people." Often DoD's response to the suggestion of having stable leadership is a new policy that calls for leadership stability. Unfortunately, the policy is typically ignored—or it's ineffectually implemented—and as a result, the problem of leadership instability has been cited in almost every DoD acquisition study I've ever read. Again, effective policy is not our problem; putting that policy into consistent practice is.

For example, six of the top eight government people leading the Air Force's F-22 program left the program this past summer. The departures were all planned before Secretary of Defense Robert Gates announced his F-22 cuts in April. Even with budget cuts and the decision to stop buying more aircraft, the F-22 remains an expensive and powerful program that will still spend $6 billion annually. Gates' decision to end the program increases the program's complexity, as the PM must now transition the government workforce into new positions and keep top industry talent on a program professed to be in its final stages.

Smooth transitions of power within government are complicated by changes in administration and political parties, but perhaps we can take a page from a National Football League playbook. This past summer, the Indianapolis Colts lost their head coach, their offensive coordinator, and their offensive line coach. However, the Colts had planned a seamless transition of power three years prior to its loss of leadership occurrence and had groomed successors to ensure there would be no degradation of its winning program. No wonder the team competes in the playoffs each year. Can we not ensure better secession planning for our major acquisition programs? There is evidence that we can.

In contrast to the F-22 program, the F-35 program had a smooth change of leadership this summer. The deputy program executive officer was promoted into the PEO position, and the system design and development PM stepped up to fill the deputy PEO position until it could be filled with an experienced PM from the F-22 program.

DoD, however, does not make such smooth transitions consistently, and as a result, Congress is interceding. Congress

Instead of appeasing our dedicated workforce with words of praise and condescension, let's help them by creating an environment that gives them a chance to be efficient and effective.

recently proposed a version of the defense authorization bill that includes a provision to keep a program manager in the same position—overseeing the electromagnetic launch system—through testing and initial production, despite the manager's promotion to rear admiral. (Usually, after a promotion, a program manager would move on to new and greater responsibilities.) DoD should have recognized the necessity on its own.

Key leadership positions on ACAT 1 programs require the highest attention within the acquisition community. Go back and change orders to keep key leaders in place. Leadership matters—keep the best people on major acquisitions.

Build on What Works

My fourth recommendation could be viewed as the flip side of the "don't reform" coin, and it is focused on preserving what works, then building upon it. I feel John Young did many great things as the under secretary of defense for acquisition, technology and logistics. Nonetheless, when we seek to reform or empower new leaders to impose their own brand of management on existing organizations, we risk losing the good that exists in the search for something better; or in the simple act of transitioning command, we discard established practices in favor of new ones that are not necessarily better.

The Thin Book of Appreciative Inquiry by Sue Annis Hammond outlines, in a 15-minute read, a philosophy for change. The primary assumption is that every organization is doing some things right and that positive change can be advanced by identifying what is working, then doing more of it. The book values the best of "what is" over identifying problems; values envisioning "what might be" over analysis of causes; values dialogues on "what should be" over analyzing possible solutions; and values innovating "what will be" over action planning.

The current under secretary of defense for acquisition, technology and logistics, Dr. Ashton Carter, needs to talk to senior staff to learn what was working. The key to any talks he may have is to avoid conversations on what failed or needs improvement and instead focus on maintaining what is working. Once DoD has identified what is working, it is usually easy to keep it going because the organizational culture is already adapted to the practices.

Shrink Headquarters Staffs

Finally, for my fifth recommendation, we shouldn't grow staffs at DoD headquarters. In fact, we should cut headquarters staffs by at least 25 percent. The Goldwater-Nichols legislation required unambiguous reporting changes for acquisition programs. Our implementation of that legislation places too many people in the chain of command that have no responsibility for results. We need to mandate cuts across the board. The irony, in my mind, is that present leadership direction is trying to build up the acquisition workforce infrastructure to fix problems created by a bloated acquisition workforce infrastructure. That's like trying to fix a flat tire with a nail. The Defense Science Board's April 2009 report, "Creating a DoD Strategic Acquisition Platform," also came to this conclusion, stating, "An oversized, inexperienced staff requires an enormous amount of coordination among people who do not know what to do or how to do it—and it can take them a long time to decide even the wrong answer. Alternatively, a few good people can quickly make the right decision based on experience and move on."

Many DoD reports highlight that we don't have enough of the trained people we need to perform large acquisitions. We've repeatedly responded to criticism by building larger and more complex staff elements that can't be staffed with qualified people. The cycle repeats itself into a never-ending downward cycle. A better response is to cut staffs, identify the skilled people that we do have, and trust them to make the right decisions.

The Time is Now

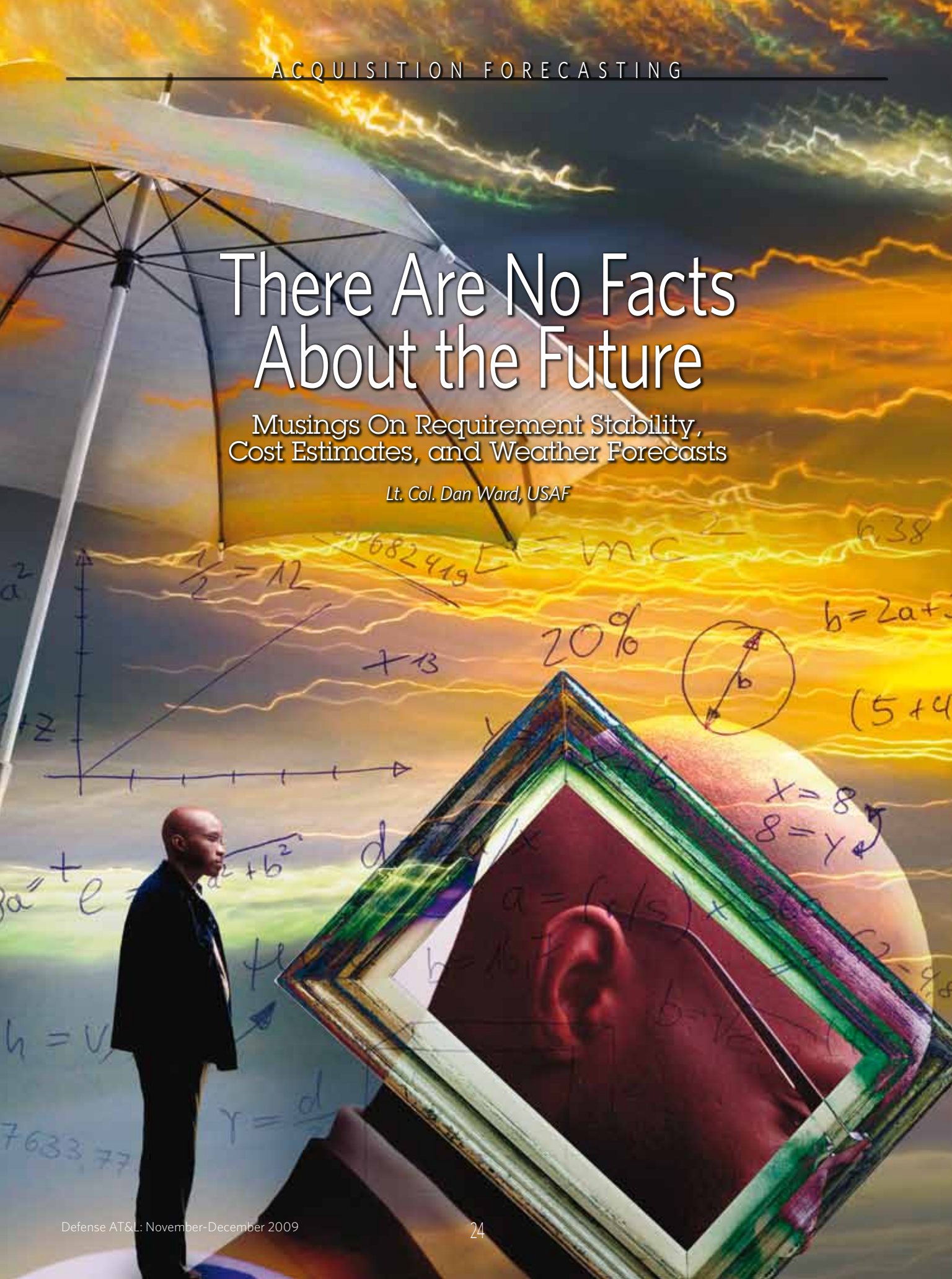
The suggestions I've provided don't require extensive rumination or excessively heavy lifting to implement. Let's do them. Don't let the simplicity of these suggestions mask their potential for doing significant good. It is past time to bring credibility back to DoD acquisition by simply delivering what we promise. A great legacy is within our reach. We can be the envy of the world for the efficiency and effectiveness with which we buy the world's best weapons systems if we have the organizational resolve and strength of leadership to make it happen.

The author welcomes comments and questions and can be contacted at **scott.reynolds@dau.mil**.

There Are No Facts About the Future

Musings On Requirement Stability, Cost Estimates, and Weather Forecasts

Lt. Col. Dan Ward, USAF



Suppose two meteorologists make predictions about the weather for a particular Saturday. Mr. Gray says there is a 50 percent chance of rain, and Mr. Blue says there is a 25 percent chance of rain. On the Saturday in question, it does indeed rain.

Which one was right: the one who predicted a 50 percent chance of rain or the one who predicted half that percentage? Were they both right? Was Gray twice as right as Blue? Can we say that one prediction was more reliable, more useful, or more accurate than the other? I don't think we can.

Yes, But Should We Take the Umbrella?

Have you ever stopped to wonder what it really means when we say there is a 50 percent chance of rain? Does it mean that on 100 Saturdays with these initial conditions, 50 will get rained on? Or is the forecaster simply 50 percent sure it will rain this Saturday, whatever that means? Is there a difference? And does either interpretation of the prediction affect our behavior? Should we take half an umbrella when there is a 50 percent chance of rain? Do we develop half a backup plan? Or simply go to the museum instead of having a picnic on half such days? And what if we pick the wrong half?

More to the point, if a 25 percent prediction of rain and a 50 percent prediction of rain can both point to a rain event and say, "See, I told you it might rain!" (or point to a non-rainy day and say much the same thing), what value is there in the prediction? How does this prediction help with our planning or execution?

There Are No Facts About the Future

Jeff Wacker, a fellow at the EDS Corporation, once explained to me: "There are no facts about the future." I thought that was an interesting observation, particularly coming from someone whose job title is "futurist." It also struck me as particularly insightful and—most important—completely true. It also struck me that being a futurist could be either really fun and easy, or really frustrating and hard. It's probably both.

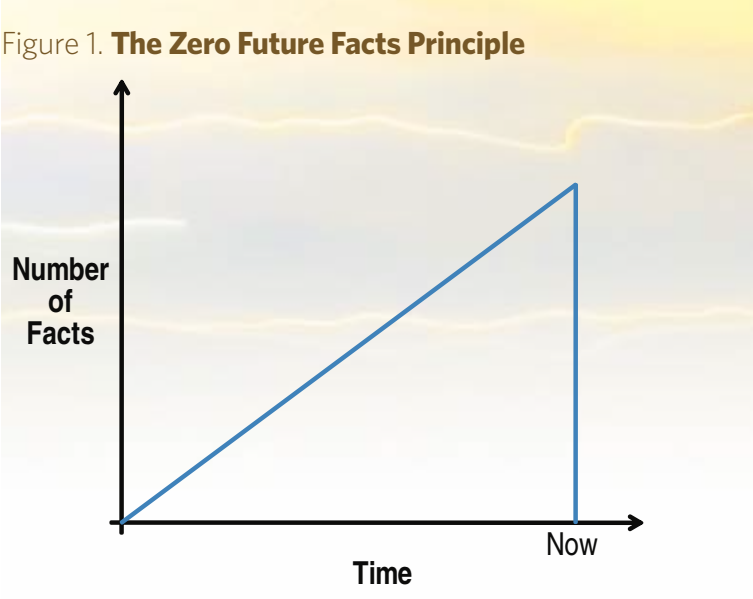
The Zero Future Facts Principle is illustrated in Figure 1. For simplicity, the number of facts in the universe is represented as increasing linearly, but this need not be the case and is not germane to this discussion. The only important fact is that beyond the Now Point, there are no facts. In the future, there are only conjectures, estimates, guesses, and predictions. We can assign a percentage to our prediction (a 50 percent chance of rain, for example), but that does not make it a fact. The only facts we'll ever encounter are about what has happened or what is happening. There are no facts about what will happen.

Ward *is the chief of process improvement and reengineering in the Acquisition Chief Process Office, Office of the Deputy Assistant Secretary of the Air Force for Acquisition Integration. He holds degrees in systems engineering, electrical engineering, and engineering management. He is Level III certified in SPRDE and Level I in PM, T&E, and IT.*

This principle has serious implications for program managers, as research by the Standish Group demonstrates. Performing research on project success and failure since 1985, Standish Group reports bluntly state that estimates come in two categories: lucky or lousy. According to their research, "there is no such thing as a reliable estimate. Learning to work better with poor estimates rather than developing better estimating techniques is crucial." One more time: there are no facts about the future.

Yet we make programmatic estimates and predictions all the time and somehow end up treating these things as facts. As Dr. Roger Atkinson poignantly observed, our projections about time and costs are "at best only guesses, calculated at a time when least is known about the project." We should be mindful of this when looking at cost estimates for a 10-year project or statements of operational requirements for the year 2020.

Figure 1. **The Zero Future Facts Principle**



Reflective Practice and Practical Reality

In order to help project leaders deal with these future non-facts, I have assembled a handful of charts and equations that are presented here for your consideration. Unlike dubious weather forecasts and cost estimates, the figures and formulas that follow are emphatically *not* based on quantitative research data. Instead, they are the result of a "reflective practice" methodology, as described by Donald Schön's book *The Reflective Practitioner.*

The discipline of reflective practice has a much stronger basis in practical reality than the so-called scientific attempts to predict with probabilities, which tend to be academic and idealized. In contrast, reflective practice primarily relies on experienced intuition and tacit knowledge—what the late Air Force Col. John Boyd, military strategist, called "fingerspitzengefuhl." My introduction of this foreign word, combined with a reference to a dead authority figure, is done

to enhance the perception of the methodology's legitimacy among those who value the trappings of scientific thought. Greek letters, Latin phrases, square brackets, mathematical terms such as "absolute value," and subscripts will be used in subsequent paragraphs for the same reason.

Since most system development efforts begin with requirements, that's where we'll start too. In many projects, a dedicated effort is made to ensure the requirements remain stable. I have even heard talk of freezing requirements at the time the contract is awarded. However, requirement stability is not always desirable or beneficial. Over time, the value and relevance of a requirement degrades, either because of advances in technology that render the required capability technically obsolete or changes in the threat environment that render the requirement operationally irrelevant. Or maybe the requirement simply wasn't very good to begin with.

Increasing the project's duration increases its exposure to any number of change events, and the impact on the project is exponentially proportional to the sum of all the delays.

Thus, I developed the Law of Requirement Stability, which states, "The viability of a stable requirement drops off at an exponential rate over time." This assumes the initial requirement was good. In the event of a poor initial requirement, the value drops off much faster.

Former Secretary of Defense Gordon England expressed his support for this law in his June 3, 2009, testimony to the House Armed Services Committee's Defense Acquisition Reform Panel. England said, "Over time, they [requirements] actually do have to change. ... It's a reality of design and production and things. You want them to change. ... It's not all bad to change requirements as a program proceeds." It appears requirements do indeed have a limited shelf life.

A corollary to this law is the Law of Stupid Stability, which states, "The stupidity of making a requirement stable is directly proportional to the timeframe over which the stability is enforced." According to the law, as a requirement resists changes over a longer period of time, the likelihood of it being stupid is increased. [Technical Note: The term "stupid" is a formal engineering term that refers to requirements pursued despite being technically obsolete, operationally irrelevant, or both]. Obviously, the timeframes in question for these two laws will vary depending on the type of technology being considered. The requirements for a piece of electronic equipment, for example, will likely become stupid at a faster rate than the requirements for a suspension bridge. It is also worth noting that these two laws apply directly to individual requirements and apply exponentially to documents containing multiple requirements.

Clearly, these laws illustrate the importance of *stable* requirements over short timelines and flexible requirements over long timelines. Some might even suggest they illustrate the importance of short timelines, *à la mode*, a *priori*, and *sine qua non* [see earlier statement about the use of foreign phrases].

More Laws and Theorems

Another way of depicting the relationship between requirement flux and time is with the Requirement Shelf-Life Ratio Theorem, which states, "The amount of time spent developing a system (T_d) should be shorter than the mean-time between legitimate requirements change (T_{rc})." Mathematically, this is represented thus: $T_d < T_{rc}$. [Note the use of subscripts, which is a universally acknowledged sign of scientificality.]

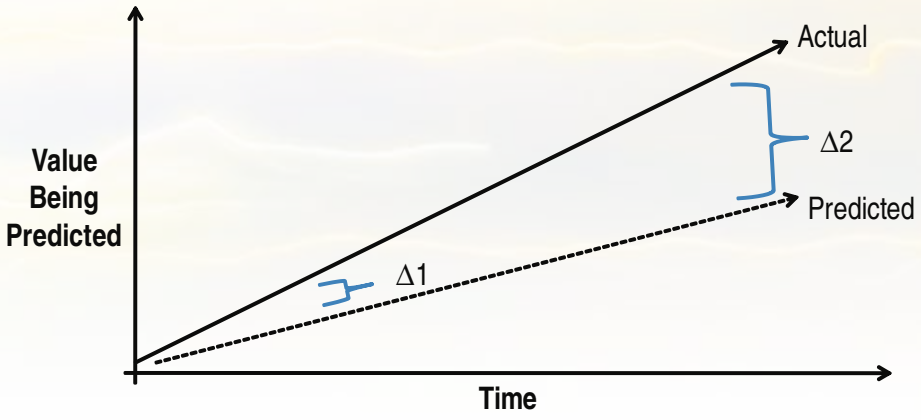
This theorem explains that if the amount of time spent developing a system exceeds the sum of the requirements' shelf-life, the resulting system will be operationally irrelevant and/or technically obsolete (i.e., "stupid") when delivered. As with the earlier laws, the Requirement Shelf-Life Ratio Theorem suggests that short timelines are much to be desired.

Once the requirements are established and the development work begins, project leaders are often faced with opportunities to delay decisions and push significant events to the right. The previous laws and theorems notwithstanding, there is a widespread belief that schedule extensions improve the project's outcome. Our research shows that such extensions should be avoided at all costs because of the Law of Increasing Impact, which states, "The impact of a delay increases exponentially with the length of the sum of the delays."

Figure 2. **Zeno's Donut of Conundrum**

Let's take a closer look at why this law is true. Over a given amount of time, projects are exposed to a certain amount of change. Over a longer timeframe, they are exposed to a greater quantity of change events. These change events increase the risk of technological obsolescence; budget instability; operational irrelevance; personnel transfer (which causes a loss of learning, accountability, and consistent leadership vision and support); and non-compliance with new regulatory requirements. Increasing the project's duration increases its exposure to any number of change events, and the impact on the project is exponentially proportional to the sum of all the delays.

Figure 3. **The Law of Error Propagation**



Close study of the Law of Increasing Impact intuitively reveals the Recursive Delay Self-Propagation Theorem, which states, "The length of a delay increases with the length of the delay." That is, any increase in a project's development schedule will cause an additional increase to the project's development schedule. Mathematically, this can be expressed as

$$D = D + \sin\alpha \sin\beta + 2\sin\tfrac{1}{2}(\alpha+\beta)\cos\tfrac{1}{2}(\alpha-\beta) + a_0 + \sum_{n=1}^{\infty}\left(a_n \cos\tfrac{n\pi x}{L} + b_n \sin\tfrac{n\pi x}{L}\right)$$

or more simply, as D = D + n, where D is the delay and n is some number. The proof is left as an exercise for the reader.

A concrete example may shed further light on this principle. Consider that a sufficiently long delay in a project leads to instability among project personnel (resulting from retirements, promotions, transfers, etc.), which leads to additional delays as the new personnel are hired, trained, and brought up to speed on the project. Each new person introduces additional change, which exacerbates the whole situation and causes more delay, making progress impossible. This principle is also known as Zeno's Donut of Conundrum, and is illustrated in Figure 2. [NOTE: Zeno's Donut of Conundrum is named after my uncle Zeno, and is not to be confused with Zeno's Paradox of Motion from Greek philosophy ... but now that I think about it, they're quite similar.]

No Certainty but Uncertainty

Let us now return to the central theme of uncertainty. Because there are no facts about the future, our estimates of future values are sometimes incorrect. For the sake of appearing scientific, we use the Greek letter delta (Δ) to represent the absolute value of the difference between a predicted value and the actual value. As an error propagates over time, the value of Δ increases according to the Law of Error Propagation (see Figure 3), which states, "The absolute value of the Δ between an actual value and an erroneously predicted value increases in direct proportion to the time over which the error is propagated." So given sufficient time, small errors become big errors. As we see in Figure 3, Δ2, which occurs later in time, is much larger than Δ1.

The Case for Short Timelines

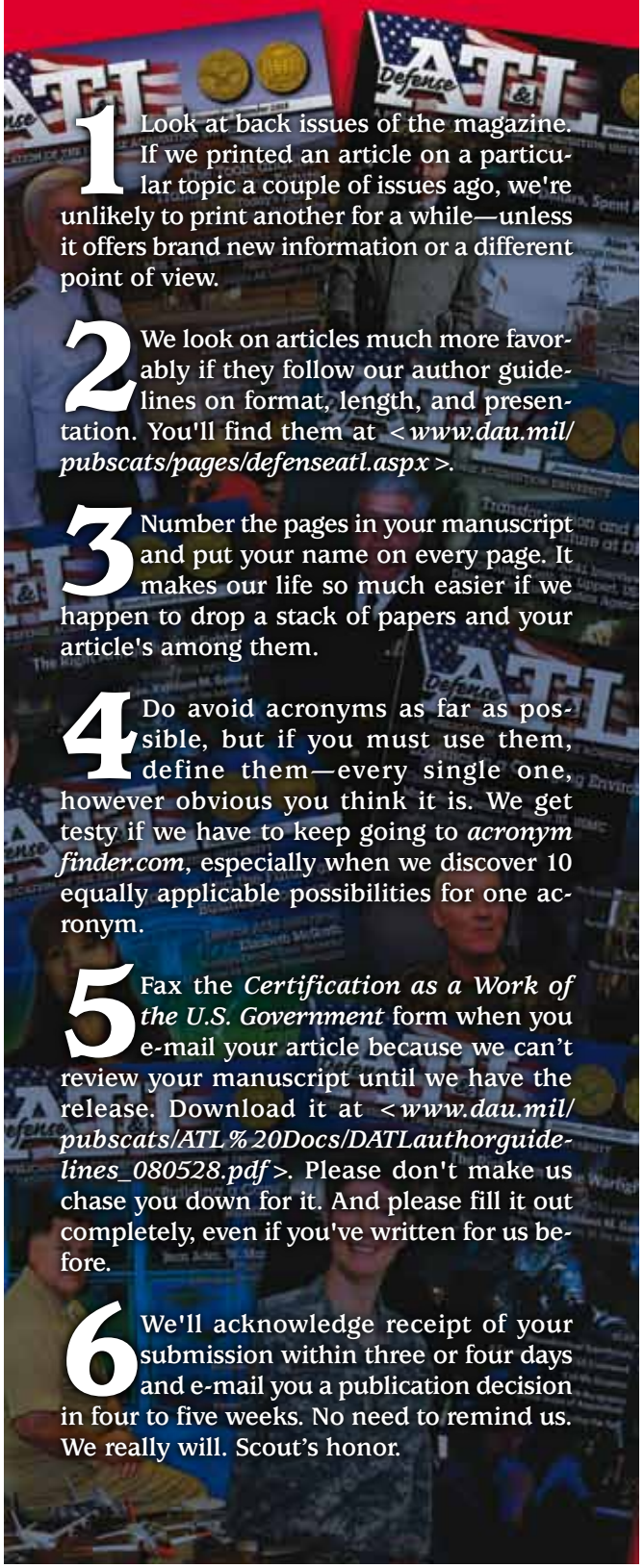
Taken together, all of these laws, theorems, and principles make a strong case for using short timelines when developing a new system. This perspective is emphatically supported by countless Government Accountability Office reports, one of which explained: "A hallmark of an executable program with a sound business case is *short development cycle times*" (Report on Selected Weapon Systems, GAO, 2008, emphasis added).

In much the same spirit, The Standish Group explained in a 1999 report that "we have long been convinced that shorter time frames ... increase the success rate." In their February 2008 newsletter, The Standish Group was more emphatic, writing that "with projects, slow kills; speed increases success." A particularly fierce report by The Standish Group observes that "time is the absolute enemy of all projects." Time therefore joins Al Qaeda and the Taliban in the latest Axis of Evil.

At this point, we briefly deviate from our preferred reflective practice method and introduce some actual research data, compliments of the aforementioned Standish Group. Some readers may wish to skip this section, and we completely understand. In our own defense, we should point out that these are someone else's data, not our own original research. We did not collect it and are merely reflecting on it. Also, note that the percentages in Figure 4 are measurements from the past, not predictions about the future.

The figure, Project Duration, Size Affect Success, presents five years' worth of data gathered by The Standish Group from IT projects. It shows the correlation between project duration, team size, and project success.

A Six-Pack of Tips for Defense AT&L Authors



1 Look at back issues of the magazine. If we printed an article on a particular topic a couple of issues ago, we're unlikely to print another for a while—unless it offers brand new information or a different point of view.

2 We look on articles much more favorably if they follow our author guidelines on format, length, and presentation. You'll find them at *<www.dau.mil/pubscats/pages/defenseatl.aspx>*.

3 Number the pages in your manuscript and put your name on every page. It makes our life so much easier if we happen to drop a stack of papers and your article's among them.

4 Do avoid acronyms as far as possible, but if you must use them, define them—every single one, however obvious you think it is. We get testy if we have to keep going to *acronymfinder.com*, especially when we discover 10 equally applicable possibilities for one acronym.

5 Fax the *Certification as a Work of the U.S. Government* form when you e-mail your article because we can't review your manuscript until we have the release. Download it at *<www.dau.mil/pubscats/ATL%20Docs/DATLauthorguidelines_080528.pdf>*. Please don't make us chase you down for it. And please fill it out completely, even if you've written for us before.

6 We'll acknowledge receipt of your submission within three or four days and e-mail you a publication decision in four to five weeks. No need to remind us. We really will. Scout's honor.

Figure 4. **Project Duration, Size Affect Success**

Project Size	People	Time (mos.)	Success Rate
< $750K	6	6	55%
$750 - $1.5M	12	9	33%
$1.5M - $3M	25	12	25%
$3M - $6M	40	18	15%
$6M - $10M	250+	24+	8%
Over $10M	500+	36+	0%

The results are striking, even if we chose to disbelieve the measured success rate for the largest projects. (Really? *None* of them succeeded? OK, I guess that's not too surprising.) The overall trend clearly shows that success and duration are inversely proportional, historically speaking. As reflective practitioners, what, then, should we make of this in terms of practical, actionable conclusions? Perhaps the most reasonable conclusion is that when launching a new project, we should establish the shortest possible schedule and ensure that schedule slips are treated as a measure of last resort. We should never expect schedule delays to help ensure project success.

This means project leaders should be willing to descope the project before accepting a schedule delay because it is generally better to deliver something rather than nothing, and to succeed a little rather than fail a lot. Similarly, the evil practice of taking money from a project in the current year and repaying it in a future year should be avoided at all costs. Such a tactic merely pushes the work out to a future year, which causes a ripple of increasing delays, and that's not good.

In order to help keep the timeline sufficiently short, the organization should probably use a small team and provide a small budget, per Figure 4. This does not guarantee success, but it seems to increase the odds (whatever that means). Such a restrained, disciplined approach has the desirable effect of enabling a larger number of small projects across the enterprise, each of which has a greater likelihood of success,based on historical trends (if we may be allowed to make a prediction about the future). Yes, it is harder to manage and deconflict a portfolio of many small projects, but isn't it more fun to have projects that succeed? And making life easier for management isn't really the point now, is it?

In conclusion, the verdict is in. Long development timelines are *contra bonos mores* and *cogito ergo sum*. If we want to successfully deliver our projects, we'd better move fast. *Quod erat demonstrandum*.

The author welcomes comments and questions and can be contacted at daniel.ward@pentagon.af.mil.

Contracting Excellence via Continuous Process Improvement

Glenn L. Starks

Process improvements to streamline contracting processes are often not undertaken because of the misconception that federal and agency-specific acquisition regulations are impediments. That misconception results from a desire to maintain acquisition integrity through the application of sometimes stringent standards and detailed processes, even when regulations and directives provide guidance to foster process flexibility. In contrast to the intent of regulatory flexibility, acquisition specialists and agencies often take extensive steps to ensure they are in compliance with regulations by developing elaborate processes, which often lead to long lead times in awarding contracts and diminished customer support. A primary complaint of customers who rely on contracting activities for support when materiel is not readily available is that logistics response times are too long as a result of lengthy contracting lead times.

Contracting processes can be streamlined and made more efficient through the application of continuous process improvement (CPI) techniques. Those techniques can not only improve customer

Starks *has almost 20 years of federal service and holds a doctoral degree in public policy and administration from Virginia Commonwealth University. He has published numerous articles on employee recruitment, leadership, managing conflict, and transforming the federal government.*

Continuous process improvement ensures DoD contracting activities will be better positioned to meet the evolving needs of the warfighter in supporting global requirements.

support through reduced lead-times but also assist in improving regulatory compliance by focusing on critical contracting processes. Although contracting processes may vary by the dollar value of acquisitions and the types of requirements being supported, CPI offers a strategy for applying improvements across the full spectrum of contracting.

What Is CPI?

CPI is a strategic approach to reduce cost, improve productivity and quality, and reduce cycle time through the application of techniques to improve output. For example, CPI techniques can improve pricing methodologies, streamline higher-level review processes, and bring efficiencies to contract administration and performance monitoring. It produces continuous benefits unless interrupted or interceded by major organizational impacts such as political, regulatory, or cultural changes.

Improvements are obtained through the application of Lean Six Sigma, which combines the practices of Lean and Six Sigma. Six Sigma improves quality by reducing the variation in production or process techniques. Lean eliminates non-value-added activities. An additional technique, Theory of Constraints, eliminates process bottlenecks. All of the areas of targeted improvements are inherent in the contracting process, making CPI a critical component of strategies leading to contracting excellence.

A misconception is that CPI is a technique primarily applicable to production processes. Motorola and General Electric were the pioneers in applying such techniques as Six Sigma in improving their production lines by reducing process variation and streamlining manufacturing processes. However, CPI is just as effective in improving administrative procedures and processes. Therefore, CPI can be employed to produce strategic improvements in DoD contracting, leading to acquisition excellence.

How to Employ CPI

Applying CPI to contracting begins by identifying all processes required for different contract types. The types range from simple acquisitions (such as micro-purchase awards for consumable items) to complex award actions (such as performance-based logistics contracts for

entire weapons systems). In all cases, each process—from acquisition planning to contract award—must be analyzed. One of the primary opportunities to reap improvements is to reduce variation in processes. For example, some acquisition specialists may perform their duties based upon their on-the-job training or process norms established in their office. For instance, specialists could gain approvals from support offices consecutively rather than concurrently. Many repetitive or duplicative efforts can be eliminated if agencies simply developed contracting process templates that outline broad contracting steps and provide standard directions on required actions.

Process analysis is to be conducted by consecutively analyzing each step in the contracting process. Some past practices, in attempting to employ contracting process improvements, have erroneously separated simple and difficult processes in the attempt to gain benefits by tackling only the most difficult tasks (such as pricing reviews) or focusing on only the simple tasks (such as those for low-dollar acquisitions). A thorough analysis involves reviewing each step separately to determine where improvements can be gained.

Inputs for each step in the contracting process must be identified: people, procedures, requirements, regulations and directives, required approvals, and systems. Each input provides opportunities for improvements. For example, identifying system improvements can streamline the acquisition time through such actions as automated clause insertion; developing system mechanisms to obtain approvals; and developing system enhancements for document storage, communication, and retrieval.

The analysis then focuses on identifying the critical steps in the contracting process. The critical path includes actions that must be taken (versus those that are optional) and the identification of the minimum time it will take to complete each. The combined time requirement of the critical path is the minimum time in which a contract can be awarded. To achieve improvements, impediments to streamlining the process are identified and strategies are developed. For example, obtaining pricing approval may be deemed a critical step for large-dollar-value acquisitions. One impediment, however, may be obtaining multiple approvals because of administrative layers of review. Actions that are not critical should be identified to determine their necessity. The tasks are to identify activities that delay or interrupt actions along the critical path and to eliminate duplicative activities.

A critical (and often overlooked) step in CPI is setting benchmarks. A single agency or activity may analyze its internal processes and make improvements it believes are world-class. However, agency standards and improvements should be compared to those of similar agencies to determine if benchmarks exist. If they do, those should be the gauges against which improvements are measured.

Reducing Contracting Lead-Times through CPI

Average Contract Award Time Before CPI Effort											
Pre-Award Planning	Small Business Coordination	Legal Coordination	Pre-Solicitation Approval	Solicitation	Proposal Reviews	Negotiations	Pricing Approvals	Post-Solicitation Approval	Amendments	Contract Award	Total Days
30 days	7 days	7 days	45 days	45 days	30 days	30 days	30 days	45 days	15 days	10 days	294 days

Average Contract Award Time After CPI Effort									
Pre-Award Planning	Small Business and Legal Coordination	Pre-Solicitation Approval	Solicitation	Proposal Reviews and Negotiations	Pricing Approvals	Post-Solicitation Approval	Amendments	Contract Award	Total Days
15 days	7 days	20 days	30 days	30 days	20 days	20 days	5 days	5 days	152 days
Using IPTs	Concurrent reviews	Proactive communication	Using FAR flexibility for commercial procedures	Concurrent actions	Co-located pricing analyst and reduced approval layers	Proactive communication	Systems capability	Streamlined and automated documentation	

The table presents a simplistic but realistic timeframe chart of an agency's contracting process for large-dollar acquisitions before and after a CPI effort has taken place. Notice that before CPI, the average total time to award a contract was 294 days. After CPI, the average total time was reduced to 152 days. The bottom row of the table outlines what actions were taken that led to improvements. The time reductions were achieved through concurrent coordination efforts (e.g., concurrent small business and legal reviews); streamlining administrative efforts (e.g., using Federal Acquisition Regulation flexibility for reduced solicitation times for commercial-type items); and improving personnel and system inputs (e.g., co-locating the pricing analyst with buyers, reducing the layers of approval for pricing, and using automated documentation processes).

The Critical Components of CPI

There are several things that are critical to establishing a successful CPI program or undertaking a CPI initiative. The first, and perhaps most important, is senior leadership support. Leadership must openly and actively endorse CPI in order to embed it into the organization's culture. Support goes beyond just sending personnel to Green Belt and Black Belt Lean Six Sigma training; senior leadership should be active sponsors of CPI projects and should engage in efforts to ensure the execution of outcomes. At the next leadership level, managers must also embrace CPI and be willing to support the investment of personnel training, the time for teams to develop strategies, and the importance of seeing beyond tactical requirements to gain strategic benefits. CPI must also become a part of an organization's strategic plan and be formally documented in an organization's vision statement and strategic plan documentation. Employees have to be flexible and accepting of new training, take the initiative in applying innovation to their day-to-day activities, and be open to supporting multidisciplinary approaches when tackling large projects.

Regulatory flexibility is another requirement of contracting CPI. In many cases, rules and regulations are already flexible in serving as guidance. However, contract specialists may apply too strict an interpretation. In other cases, agencies apply stringent interpretations to federal regulations in issuing local directives and guidance. Agencies should review their local clauses and directives at least once every three years to ensure they adhere to best governmental and commercial standards of flexibility. Lastly, there may be a need to lobby headquarters or other oversight and governing bodies in attempts to have regulations changed to foster process improvements.

A critical component of CPI is a tracking system for reporting all completed, in-process, and planned CPI projects. The system should outline key milestones, primary and collateral offices of responsibility, and desired outcomes; and (for completed projects) should track progress over time. The tracking system should include complete details on CPI outcomes, specifically the details on the refined process steps outlining the streamlined contracting process.

Tracking CPI efforts also entails continuous monitoring of outcomes for analysis of potential improvements. The goals of institutionalized CPI are to continue nurturing the improvement process and to develop personnel to be more readily able to identify areas of potential improvement.

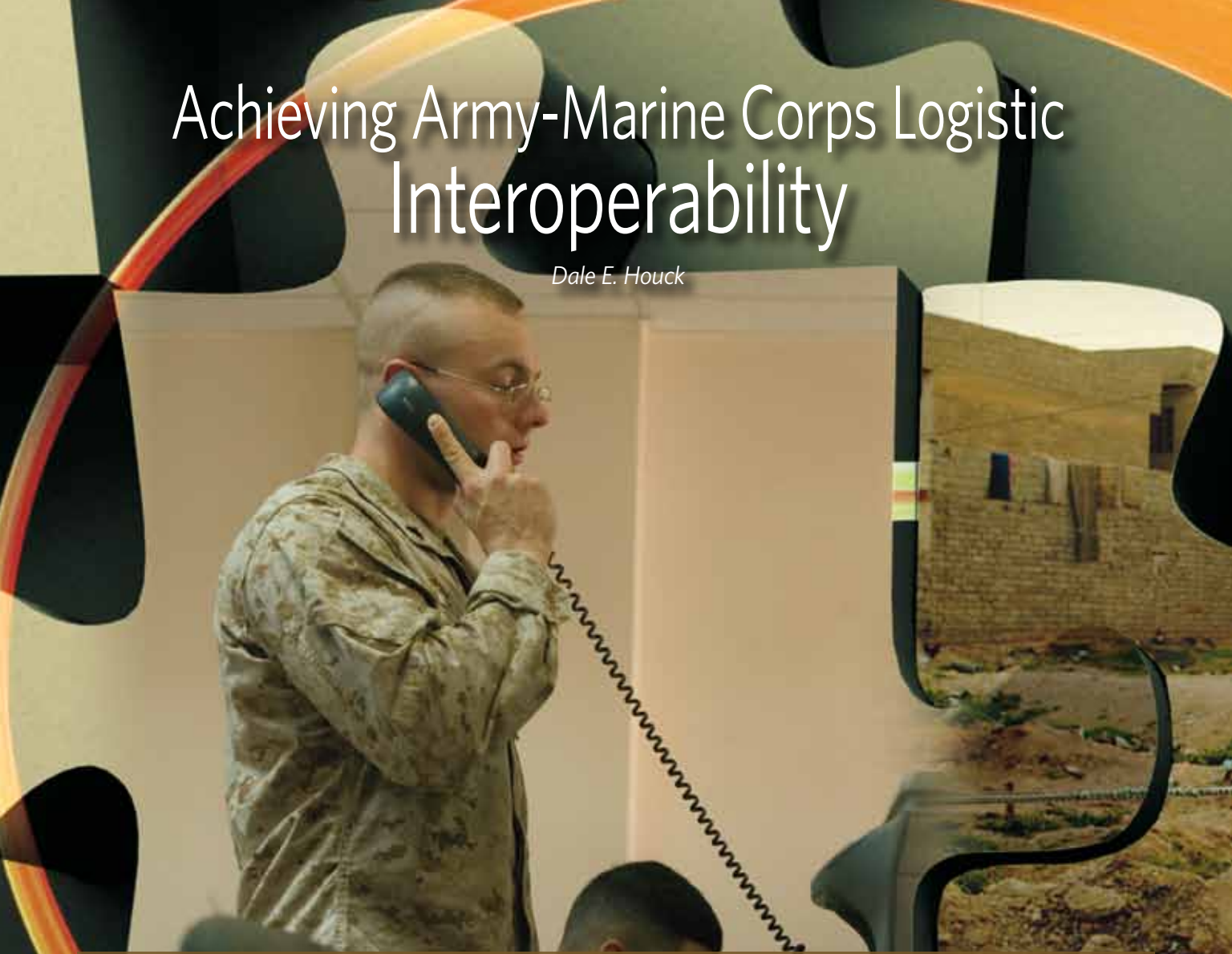
A Critical Future Investment

CPI is an effective tool in reducing costs, improving efficiencies, and sustaining quality. It is a strategic tool that embeds continuous improvement in the culture of the organization. The benefits of CPI can be applied to contracting processes to produce streamlined processes that improve support to customers. CPI is a critical investment in the future of all contracting agencies and ensures DoD contracting activities will be better positioned to meet the evolving needs of the warfighter in supporting global requirements.

The author welcomes comments and questions and can be contacted at glenn.starks@dla.mil.

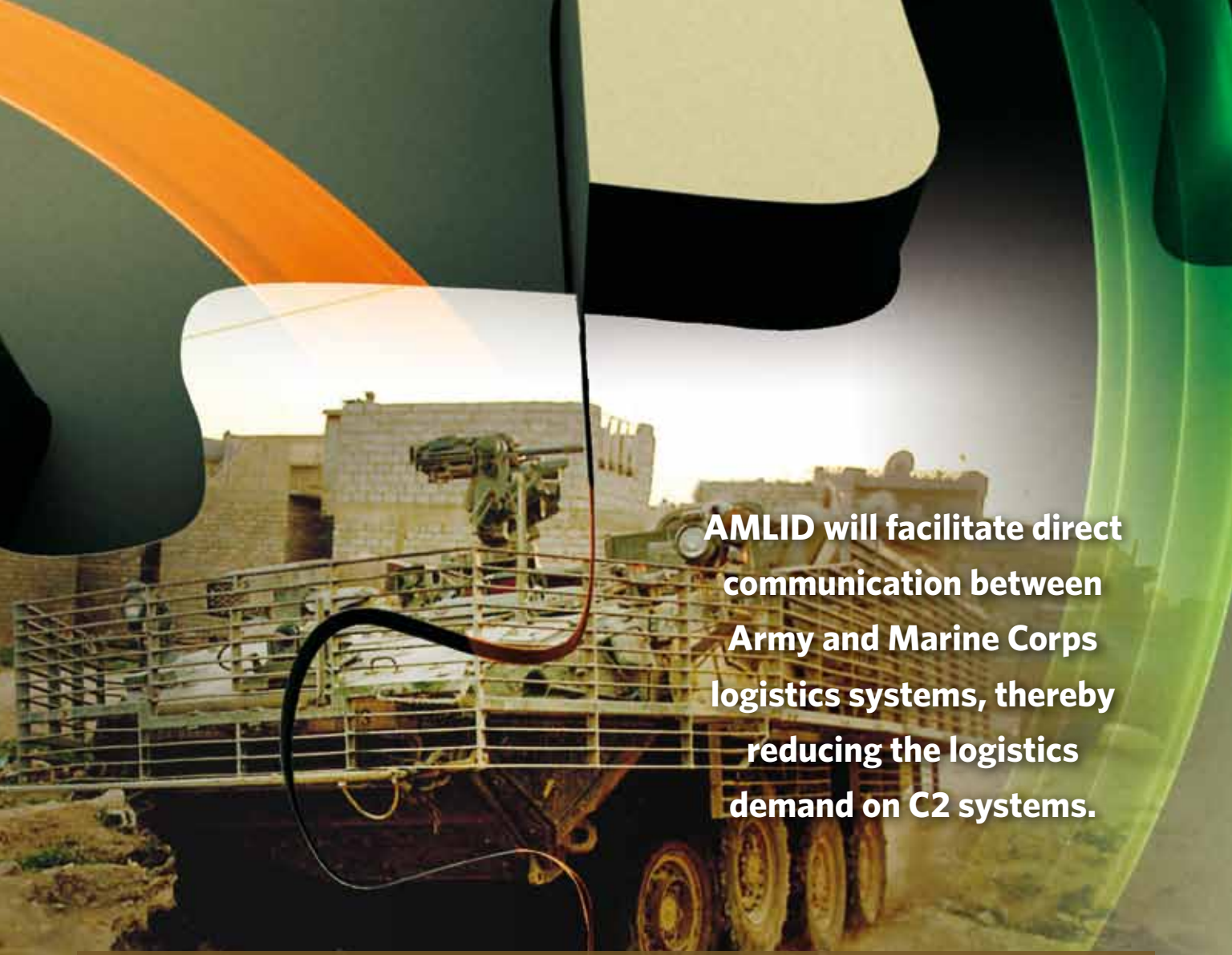
Achieving Army-Marine Corps Logistic Interoperability

Dale E. Houck



An Army Stryker battalion is attached to a Marine expeditionary brigade's regimental combat team, which is being supported by the brigade's logistics forces ashore and at sea. On the fifth day of operations ashore, a Stryker health management system identifies a maintenance problem and automatically initiates a call-for-support message. The Stryker crew uses the platform's embedded interactive electronic technical manual to verify the turbocharger has failed and must be replaced. The platform commander submits the call-for-support message for maintenance, providing necessary information to the Stryker battalion supply and logistics officer by means of Force XXI Battle Command, Brigade-and-Below/Joint Capabilities Release (FBCB2/JCR), an automated information system that facilitates enhanced tactical command and control (C2) and situational awareness through the incorporation of interoperable data standards and messaging methods. The supply and logistics officer analyzes the situation and determines he has neither the parts (meaning the turbocharger) nor qualified maintenance

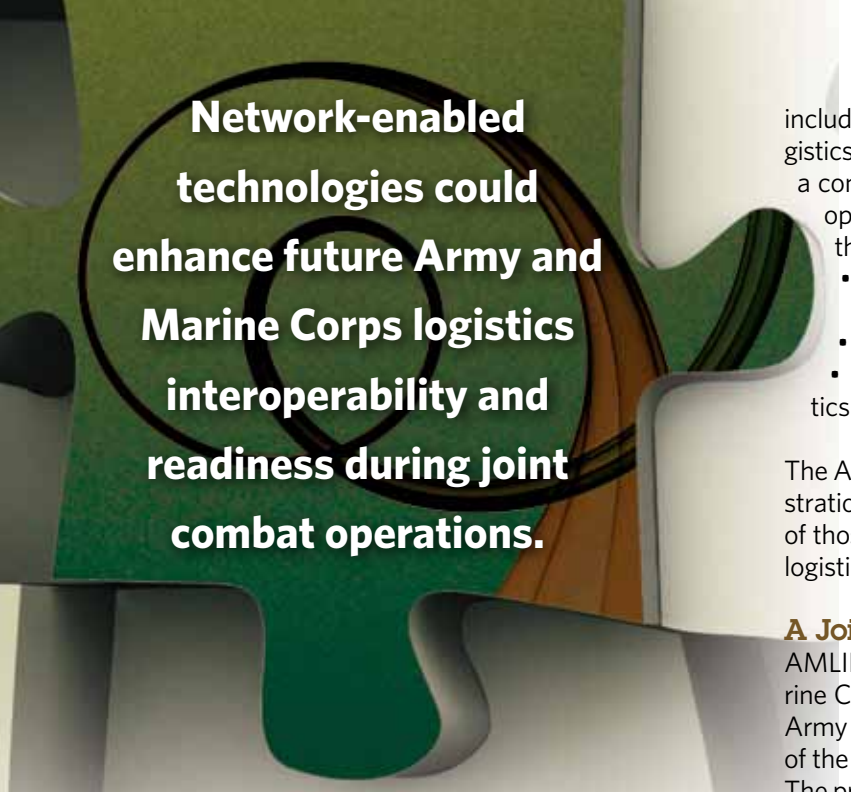
Houck *is a retired Marine Corps colonel with a background in logistics and information technology. A graduate of the Naval Postgraduate School and the Army War College, he now works for the U.S. Army Logistics Innovation Agency.*



AMLID will facilitate direct communication between Army and Marine Corps logistics systems, thereby reducing the logistics demand on C2 systems.

personnel (meaning limited forward maintenance team support attached to the Stryker battalion) to support this problem. He forwards the call-for-support message to the Marine Corps' direct support combat logistics battalion operations officer. At the same time, information is extracted from the variable-message-format call-for-support message to automatically open a service request for maintenance in the Marine Corps' logistics business system, the Global Combat Support System-Marine Corps. The direct support combat logistics battalion operations officer uses GCSS-MC to determine that qualified maintenance personnel are available, but the required part is not. The direct support combat logistics battalion operations officer (located ashore) initiates a requisition for the turbocharger in GCSS-MC and forwards it to the general support combat logistics battalion operations officer (located at sea). The general support operations officer cannot satisfy the requirement and forwards the requisition via GCSS-MC to the sea-base, where the turbocharger is sourced. The reinforced combat logistics regiment manages the distribution of the turbocharger to the direct support combat logistics battalion operations officer, who then ensures the turbocharger and a maintenance contact team are sent to fix the Stryker.

While that scenario is hypothetical, it is typical of the circumstances faced by soldiers and Marines in joint operations. In the scenario, the request for support, initiated as an FBCB2/JCR variable-message-format message, is automatically and seamlessly integrated into the business processes and systems of the supporting service without requiring either service to change its unique processes or systems, demonstrating true joint logistics interoperability. The scenario illustrates how network-enabled technologies could enhance future Army and Marine Corps logistics interoperability and readiness during joint combat



Network-enabled technologies could enhance future Army and Marine Corps logistics interoperability and readiness during joint combat operations.

operations. Inter-Service obstacles to seamless communications are overcome, and common logistics support is delivered to the operational commander on the battlefield.

Operations Desert Storm, Iraqi Freedom, and Enduring Freedom revealed that joint and Service logistics systems that could not communicate with each other resulted in order-fulfillment lag times, redundant ordering, choked supply pipelines, and uncertainty for the warfighter. It was readily apparent that deployable, integrated technology was necessary to provide responsive, agile, and flexible logistics support to the warfighter. As a result, the Army and Marine Corps have been collaborating to leverage and integrate their logistics capabilities to accomplish missions at the tactical level.

Future Imperatives

Two imperatives needed to ensure operational logistics adaptability are reduced logistics demand and intelligent supply chains, with both enabled by data fusion and science and technology. Operational logistics adaptability translates to decision making in the face of complexity and the ability to share information across the joint force unhindered by distance, terrain, weather, or hostile activity; and intelligent supply chains of the future will require radically advanced data collection, transmission, analysis, and discovery of relationships normally hidden in vast quantities of data scattered throughout multiple global data bases. Reduced logistics demand and intelligent supply chains will require integrated and interoperable logistics systems and processes, providing a near-real-time logistics common operating picture and adhering to common net-centric standards and protocols—necessary for success within a common logistics operating environment.

The future land component will be, by necessity, net-centric and interoperable within the full range of military operations, including interagency and coalition partners. The Joint Logistics White Paper (draft version 0.6, June 2009) describes a concept for providing logistics support to a future joint operating force in the 2016-2028 timeframe. It describes three well-documented issues that must be overcome:

- Insufficiently integrated logistics organizations and processes
- Execution issues
- Insufficiently interoperable/integrated C2, logistics management, and financial systems.

The Army-Marine Corps Logistics Interoperability Demonstration (AMLID) is a significant step in addressing several of those issues as it works toward improved Army-Marine logistics capabilities.

A Joint Effort for Interoperability

AMLID project is a joint effort between the Army and Marine Corps, with project management provided by the U.S. Army Logistics Innovation Agency, a field operating agency of the Office of the Deputy Chief of Staff of the Army, G-4. The project's goal is to enable Army-Marine Corps logistics interoperability and joint interdependence by creating the capability to exchange actionable information across Service boundaries needed for joint task force employment. Interoperability—the basic tenet of AMLID—provides a compelling case for obtaining required support for a tactical unit from an attached sister Service, as far forward as possible, to eliminate the requirement to conduct reachback logistics support via stovepiped Service systems.

AMLID will perform information exchanges of platform-generated data between logistics and C2 systems. That will result in a cross-Service fulfillment of a logistics support request; and the sharing of common situational awareness across the joint logistics operating environment, building on both Services' logistics operational architectures. AMLID will provide a useful, near-term practical application of logistics C2 convergence through advanced technology insertion. It will allow Services to operate using their business systems and practices, but still operate jointly. AMLID seeks to provide rapid inter-Service fulfillment of a common sustainment requirement in time-sensitive situations (i.e., when it is more efficient or effective as a result of one or more factors related to mission, enemy, terrain and weather, troops and support available, or time available). While AMLID will demonstrate information exchanges from the platform level via FBCB2/JCR to another Service's logistics system, its metadata dictionary and data translation standards, defined during development of the initial system interfaces, could support further development of a broader spectrum of system interface software and more extensive net-centric logistics capabilities.

Creating Logistics Synergy

AMLID, a four-phased project, will facilitate direct communication between Army and Marine Corps logistics sys-

tems, thereby reducing the logistics demand on C2 systems. The AMLID team will develop the seamless integration of variable-message-format data between tactical C2 and logistics systems from each Service as well as the automated extraction of variable-message-format data from the tactical C2 systems and insertion directly into each Service's logistics systems to automatically open service requests, work orders, and supply requisitions. The team has developed a software interface tool known as the Marine-Army Joint Interoperability Component using a service-oriented architecture approach to bridge the gap between systems and networks. A service-oriented architecture approach provides a framework for organizing and orchestrating application functions/services across system boundaries. Within this framework, MAJIC acts as the translator to enable FBCB2/JCR variable-message-format combat service support messages to be exchanged and accurately interpreted among supporting and supported units.

The AMLID use-case scenarios address likely threat scenarios. The use-case technique is used to capture a system's behavioral requirements generated from requests that are based on scenario-driven threads. Completed in March 2009, AMLID Phase I was a laboratory-based demonstration of interoperable network architecture that tested prototype system interfaces and information exchanges. Scenarios were focused at the tactical echelon and included mission threads for resupply of petroleum, oil, and lubricants; ammunition; logistics situational awareness; and maintenance support. The intent was to simulate logistics calls for support by passing Joint Capabilities Release-initiated information to GCSS-MC through an enterprise service bus and to a standard Army management information system (STAMIS). FBCB2/JCR version 1.0 was used to send variable-message-format logistics messages from the Marine Corps to the Army and included situation reports, logistics status reports, and call-for-support messages.

Phase I

The Phase I demonstration, conducted at the Marine Corps GCSS-MC System Integration Lab at Pennsylvania State University's Applied Research Laboratory, successfully demonstrated interoperability between Army and Marine Corps information transmissions via FBCB2/JCR, each Service's logistics systems, and MAJIC. Four different use-cases were evaluated, resulting in a 97-percent success rate for the message transfer/translation process. Phase I—and MAJIC in particular—demonstrated that Army and Marine Corps tactical units can transmit requests for emergency logistics requirements between logistics systems using interpretive software (middleware) to translate the raw data inherent in the variable-message-format requests between the Services.

Phase II

AMLID Phase II is currently under way. It includes a senior leadership live platform demonstration that showcases a network architecture expanded to include C2 and logistics systems and processes up to and including the operational echelon. The demonstration consists of two scenarios—forced-entry operations and decisive land operations—with each scenario incorporating situational awareness threads integrated with related C2 monitoring systems. The forced entry operations scenario will include a use-case and thread for petroleum, oil, and lubricants; ammunition; distribution; and logistics situational awareness, while the decisive land operations scenario will focus on repair parts, maintenance, distribution, and logistics situational awareness. The ability to seamlessly communicate requests for service, feedback, and status information between GCSS-MC and the Army STAMIS/GCSS-Army system is a primary objective. A successful demonstration will provide a valuable assessment on the potential to eventually extend the same capability to Global Combat Support System-Joint.

Phase II—which is designed to successfully pass logistics information between Service logistics systems—will significantly advance the utility of interoperability, resulting in platform-level data aggregated in C2 systems and joint logistics situational awareness. Information will flow between operating combat platforms, a Marine Corps light armored vehicle, and an Army Stryker using FBCB2/JCR—through MAJIC—allowing information to go from one Service to another. Upon completion, AMLID will have developed consolidated mission threads for petroleum, oil, and lubricants; ammunition; and repair parts; as well as distribution in-transit visibility and logistics situational awareness. DoD's Battle Command Sustainment and Support System will be integrated into the overall network architecture in order to manage logistics situational awareness through the various logistics supporting establishments to the theater sustainment command and Joint Task Force component commander.

Successful completion of Phase II will serve as a foundation for prospective follow-on Phases III and IV. AMLID team stakeholders envision Phase III to be the development of a fielding plan for the logistics interoperability functionality that was developed, blueprinted, and demonstrated during Phases I and II. The project would culminate in Phase IV, providing for the advanced integration of AMLID technology into other closely related logistics modernization programs, such as the Marine Corps' Autonomic Logistics effort and the Army's Conditions-Based Maintenance Plus project. While not yet officially sanctioned by Service proponents, those follow-on efforts could potentially support the objectives of the Services' combat service support and sustainment missions and the visions outlined in their higher-level logistics architectures.

Logistics Architectures

AMLID is a major initiative of the Army's Common Logistics Operating Environment Program and is aligned with objectives of the Marine Corps' Logistics Modernization program and Joint Forces Command's Joint Interoperability and Data

Dissemination Strategy. The Common Logistics Operating Environment is the Army's capstone initiative to synchronize diverse logistics modernization efforts into a cohesive, net-centric logistics domain. The effort integrates data across the full spectrum of logistics and includes equipment platforms, logistics information systems (including GCSS-Army), and C2 systems—all functioning within a common architectural framework described in detail by the Army's Training and Doctrine Command-validated Army Integrated Logistics Architecture. That architecture spans from the tactical through strategic echelons; supports a joint, integrated environment; and assists the Army logistics community in achieving integration and interoperability in the logistics domain.

The Marines' Logistics Modernization Program will produce a more effective and efficient logistics chain management process, with modernized, integrated, and streamlined supply, maintenance, and distribution processes that conform to the Marine Corps' Logistics Operational Architecture. The architecture supports the implementation of enterprise-wide processes for logistics and will be supported by a thoroughly modernized enterprise resource planning system, GCSS-MC.

Both the Army and the Marine Corps architectures provide the framework to clearly define logistics processes and to implement net-centric warfare principles in the logistics domain. Additionally, they provide the foundation to move beyond the unsynchronized use of a handful of common C2 systems and help realize a unity of effort within the logistics joint capability area.

Architecturally, AMLID supports both the Army's and the Marine Corps' logistics architectures and seeks to provide a flexible support construct that integrates various logistics systems across Service boundaries. It is accelerating the technology maturation process for logistics automation in a joint operational environment. The Phase II demonstration will provide an early opportunity to perform focused testing on the latest version of GCSS-MC's Release 1.1 software and evaluate its prospective future interoperability with the Army's STAMIS. Ultimately, DoD Architecture Framework products developed for AMLID will be fed back to the Marine Corps' Logistics Operational Architecture and the Army Integrated Logistics Architecture to assist in the further development of common data standards and associated architectures that will facilitate logistics net-centricity and fully integrated Army and Marine Corps operations.

A Significant Step

The Army and Marine Corps continue to reduce gaps in logistics interoperability related to organizational and system interface differences and non-standard architecture. AMLID identifies gaps in process or system interoperability where additional work may be necessary in order to support the development of a composite architecture (the Marine Corps' Logistics Operational Architecture and the Army Integrated Logistics Architecture) necessary for joint interoperability. AMLID's service-oriented architecture allows different applications to exchange data, and tools such as MAJIC will make it possible to securely exchange information between Service enterprise resource planning systems and legacy systems.

AMLID does not purport to be a final solution in resolving interoperability issues between the Army and Marine Corps or other DoD services and supporting government agencies; however, it is the focused application of technology solutions to improve the efficiency of Army-Marine Corps operations as part of a joint force. AMLID is a significant step in achieving:

- More effective and efficient joint logistics
- The coordinated use, synchronization, and sharing of two or more military departments' logistic resources to support the joint force
- A foundation for future programs, such as GCSS-Joint.

As AMLID evolves to support remaining classes of supply, it will integrate disparate Service information systems and data to provide enhanced visibility of resources and requirements; and it will provide Army brigade combat teams and Marine Corps regimental combat team commanders, and ultimately all of DoD, an effective means to achieve mission objectives.

As AMLID evolves, it will integrate disparate Service information systems and data to provide enhanced visibility of resources and requirements.

The author welcomes comments and questions and can be contacted at dale.houck1@us.army.mil.

STATEMENT REQUIRED BY THE ACT OF AUG. 12, 1970

SECTION 3685, TITLE 39, U.S.C.
SHOWING OWNERSHIP, MANAGEMENT, AND CIRCULATION

Defense AT&L is published bimonthly at the Defense Acquisition University, Fort Belvoir, Va. 22060-5565. The university publishes six issues annually. The director of the DAU Press is Eduard Boyd; the managing editor of Defense AT&L is Carol A. Scheina; and the publisher is the Defense Acquisition University Press. All are collocated at the following address: Defense Acquisition University, Attn: DAU Press, 9820 Belvoir Rd., Ste. 3, Fort Belvoir, Va 22060-5565.

Average Number of Copies Each Issue During The Preceding 12 Months

A. Total number of copies printed (net press run) _____ 22,451
B. Paid and/or requested circulation:
   1. Sales through dealers and carriers, street vendors, and counter sales _____ 0
   2. Mail subscriptions paid and/or requested _____ 21,960
C. Total paid and/or requested circulation _____ 21,960
D. Free distribution by mail, carrier, or other means; samples, complimentary, and other free copies _____ 329
E. Total distribution _____ 22,344
F. Copies not distributed _____ 107
G. Total distribution _____ 22,451

Actual Number Copies of Single Issue Published Nearest To Filing Date

A. Total number of copies printed (net press run) _____ 22,930
B. Paid and/or requested circulation:
   1. Sales through dealers and carriers, street vendors, and counter sales _____ 0
   2. Mail subscriptions paid and/or requested _____ 21,643
C. Total paid and/or requested circulation _____ 21,643
D. Free distribution by mail, carrier, or other means; samples, complimentary, and other free copies _____ 1,057
E. Total distribution _____ 22,780
F. Copies not distributed: _____ 150
G. Total distribution _____ 22,930

Leveraging Nunn-McCurdy to Ensure Program Success

Dennis K. Van Gemert

Those involved with the acquisition of complex defense systems begin with enthusiasm for the challenging task ahead and confidence that the program and technical goals can and will be met—so why do so many programs fall short of their operational cost goals? For instance, in an environment focused on systems engineering revitalization and

Van Gemert *is a part-time instructor of project management at The University of California, Irvine. He holds master's degrees in aerospace engineering and project management, and is a certified project management professional.*

increasing technical rigor, how does systems engineering fall short of its intended purpose of ensuring cost and capability? How might the Nunn-McCurdy Act adversely affect total taxpayer cost of a system? How might it refocus our design approach? This article addresses those questions.

Life Cycle Costing

Life Cycle Cost = Initial Capital Expenditures + Design and Development Costs + Production Costs + Operations and Maintenance Costs + System Disposal Costs

The system life cycle cost is the total cost of the system from concept through disposal. It is what the system or product will have cost you at its end of life, including the disposal cost and anything offset from salvage value. Salvage value is what the system is worth at end of life, provided that it has any residual value. An example of a system that retains a positive salvage value is an aircraft. At the end of its life, even a 50-year-old air tanker can be sold for scrap metal or stripped for parts that may still be usable on working aircraft or other systems that use the same parts. An example of an item that retains no salvage value at end of life is radioactive waste. Such waste must be disposed of in a strict and costly process.

Systems engineering must be integrated with earned value management and risk management to present the program manager with a comprehensive dashboard view of program information that is essential in making critical program decisions.

Most systems have a disposal cost that is offset by some degree of salvage value, and in some cases, salvage value exceeds the disposal cost. For example, when a car is no longer drivable, a salvage yard will most likely be willing to pay for that vehicle. The salvage yard will intend to gain a profit by selling the individual parts for more than the vehicle itself is worth.

What is the value of a tank at end of life? Can it be stripped for usable parts? Can the metal be recycled? Are there any components that require special disposal requirements? Those are questions that must be discussed during system-concept definition and solved during concept definition and development.

Understanding the relationship between components of life cycle cost is essential to successfully executing the systems engineering process and realizing its true benefit. Disciplined life cycle systems engineering is essential to producing an affordable system that meets its schedule, performance, and cost targets.

Direct Versus Indirect Products

A direct product is that which the program seeks to produce as an end product. Direct products are usually composed of software and hardware. An indirect product is that which contributes to the development of a direct product. Systems engineering produces indirect products, generally in the form of paper (i.e., plans, specifications, operational concepts, architectural diagrams, trade studies, use cases, etc.). Indirect products enhance the quality and performance of the direct products while simultaneously increasing the likelihood of meeting cost and schedule goals. Most of the value of the systems engineering plan is in the document creation itself, more so than in its implementation. Creating the systems engineering plan fosters collaboration, integration, teamwork, and positive working relationships while simultaneously breaking down walls and stovepipes that hinder forward progress. Since direct products have a high degree of visibility, they receive the most attention during a budget challenge. Cutting indirect products may not cause a visible symptom to the program for weeks to years, with the most likely symptoms being higher operational testing, deployment, and operational costs as well as failure to meet some system requirements. The focus on the near-term tangible direct products of machined metal and coded software should not be at the expense of the long-term system life cycle performance parameters.

Saving Dollars Over the Long Run

Congressional budget cuts are commonplace, especially in ACAT [*Acquisition Category*] I programs. History has shown that the Government Accountability Office estimate at completion will exceed the system program office's estimate at completion, and Congress will allocate less than what the system program office requests. That problem is compounded by annual congressional budget cuts and reallocation of funds. The budget cuts are manageable provided that a comprehensive systems engineering plan is in place that holds true to the systems engineering tenet of

managing total system life cycle costs. In the interest of the Nunn-McCurdy Act [*which requires Congress to be informed of programs with cost growth of more than 15 percent and calls for the termination of programs whose total cost grow by more than 25 percent over the original estimate*], program offices often decide that remaining off the congressional radar screen takes precedence over minimizing the total life cycle cost to the taxpayer and the cost burden to the system operator.

Putting yourself in the systems engineering role, you may find that for a modest investment of, say, an additional $10 million in developmental analysis and design costs, you could save more than $100 million in operational, logistics, and maintenance costs during the operational life of the system. This seems like a no-brainer, right? Not really. Let me explain why. Chances are, you will receive resistance from the program office due to budget pressures. After all, keeping the program running is of utmost priority, and violating the budget will most definitely bring unwanted attention to the program. It is often easier to say no than to explain to the chain of command—including Congress—why it is the right thing to do.

Let's not forget that systems engineering is an indirect product, and thus, it will be most likely hit hardest by any proposed or implemented budget reductions. Even if there are no budget cuts, overruns can be taken out of the systems engineering tasks to support the direct products. So don't be surprised when you, the systems engineer, hear that your design enhancement is a great idea; however, there are no funds to support it at this time, and besides, the $100 million won't occur until the system is fielded and will be spread out (amortized) over 20 years of operations.

And thus, one of the key purposes of implementing systems engineering on a program—achieve the best value to the user while ensuring capability thresholds are met—is being violated. If a $10 million design change saves $100 million in operations and maintenance costs, then you have saved the taxpayer $90 million in total life cycle costs. One could argue that a total life cycle of 25 years (5 year development and 20 year operations) amortizes the $90 million savings over 25 years, making it insignificant on a yearly congressional budget basis. On the other hand, the savings results in a $3.6 million savings per year. Now multiply that type of savings over many development programs and then you can address some of the capabilities needed from the unfunded requirements list.

The Department of Defense should be focused on total life cycle cost of a system, not the cost on a year-by-year basis. That requires long-term strategic thinking and planning—something that could only benefit our greatest military in the world! Involving engineering, logistics, and maintenance technicians during the early design concept phase of the avionics bays may be more costly upfront, but it will save a great deal of money in the long haul. The difference between a few hours and several days of downtime to perform routine inspection and servicing of critical components is not just budget burden but also an asset-availability concern.

From Good Intention to Implementation

Implementing system life cycle costing is all about educating congressional members and their staffs on the value of a disciplined life cycle costing approach to defense systems acquisition. DoD and its contractors have an important role in ensuring that Congress is informed during the budget process of possible short-term budget challenges and their impact to the total cost of system procurements. Congress has the power to specify that cuts may not be made to systems engineering products and processes (e.g., life cycle costing, planning, requirements management, disposal analysis, human factors engineering, etc.) The defense acquisition community must educate its decision makers and change its propensity to focus on short-term budget issues at the expense of the long-term financial health and affordability of defense, homeland security, or intelligence systems. While software and hardware show tangible progress towards an end goal, they may be misleading indicators if schedule and budget baselines are compromised in the process. Re-work is very expensive, and deploying a system that is not optimized to reduce operations cost is even more costly. Maintainability and availability of a system must be designed in at the system level and flowed down to the component level. It is a unique opportunity for collaborative learning between DoD, its contractors, and Congress. Working groups harnessing the knowledge of Congress and industry experts could inject a new level of affordability into national security procurements, allowing the taxpayer to get more bang for the buck.

Reducing the Long-Term Life Cycle Costs

Next time you are sitting through that long design review, don't be too shy to ask, "How will you get at that frequently replaced component without having to perform major disassembly of the vehicle?" After all, would it make sense to have to remove the engine block from your car to change the oil or a headlamp? This example may seem a bit overzealous, but it is presents a strong parallel to real-world occurrences. Many engineers are not taught early in their careers to design for maintainability. One exception to this case is the design of the International Space Station, in which all engineers were required to participate in training courses geared towards teaching how to design for safety and maintainability. Training involved using simulators to demonstrate an astronaut's limitations during on-orbit servicing of the station. They were taught to understand the difficulties of operating tools while floating in a vacuum and from within a pressurized space suit.

A design team can often significantly reduce the total life cycle cost of a system by reaching across disciplines to execute a rigorous systems engineering approach. Often by increasing the design, development, and test budgets,

On Your Way to the Top? *DAU Can Help You Get There.*

If you're in the Defense Acquisition Workforce, you need to know about the Defense Acquisition University. Our education and training programs are designed to meet the career-long training needs of *all* DoD and defense industry personnel.

Comprehensive—Learn what you need to know

DAU provides a full range of basic, intermediate, and advanced curricula training, as well as assignment-specific and continuous learning courses. Whether you're new to the acquisition workforce or a seasoned member, you can profit from DAU training.

Convenient—Learn where and when it suits you

DAU's programs are offered at five regional campuses and their additional training sites. We also have certification courses taught entirely or in part through distance learning, so you can take courses from your home or office. Check out the 100-plus self-paced modules on our Continuous Learning Center Web site at www.dau.mil/clc/default.aspx.

You'll find the DAU 2010 Catalog at www.dau.mil. Once you've chosen your courses, it's quick and easy to register online. Or contact DAU Student Services toll free at 888-284-4906 or student.services@dau.mil, and we'll help you structure an educational program to meet your needs. DAU also offers fee-for-service consulting and research programs.

DAU

DEPARTURE OF MAGAZINE ART DIRECTOR

Defense AT&L magazine wishes Paula L. Croisetiere a fond farewell as she moves on to a new position as a courseware production/process manager for DAU's e-Learning and Technology Center.

Croisetiere has served as the magazine's art director for 18 years, beginning when the magazine was known as *Program Manager. It* was later renamed *PM*, and in 2004, it became *Defense AT&L* magazine. She oversaw the redesign of the magazine's masthead with each name change. In addition, under Croisetiere's oversight, the magazine underwent multiple redesigns, continually improving over the years as it transformed from a single-color newsletter format to its current full-color, magazine format. Numerous readers have commented on the high quality of the magazine's design, and Croisetiere's efforts were a significant contributing factor in the magazine's recent recognition with a 2009 APEX award for publication excellence from Communications Concepts.

In addition to serving as art director for the magazine, Croisetiere served as the senior graphic designer and prepress production manager for DAU's Visual Arts and Press division. She worked on numerous DAU Press publications, among them the university's catalogs, strategic plans, brochures, and displays; and was heavily involved in the development and maintenance of the university's branding program.

Croisetiere, who has 25 years of graphic design experience, began her career as a commercial art instructional aide for the Arlington Career Center, then served multiple positions in private industry before becoming a visual information specialist at the Defense Mapping School. She joined the Defense Systems Management College in 1991 as a visual information specialist.

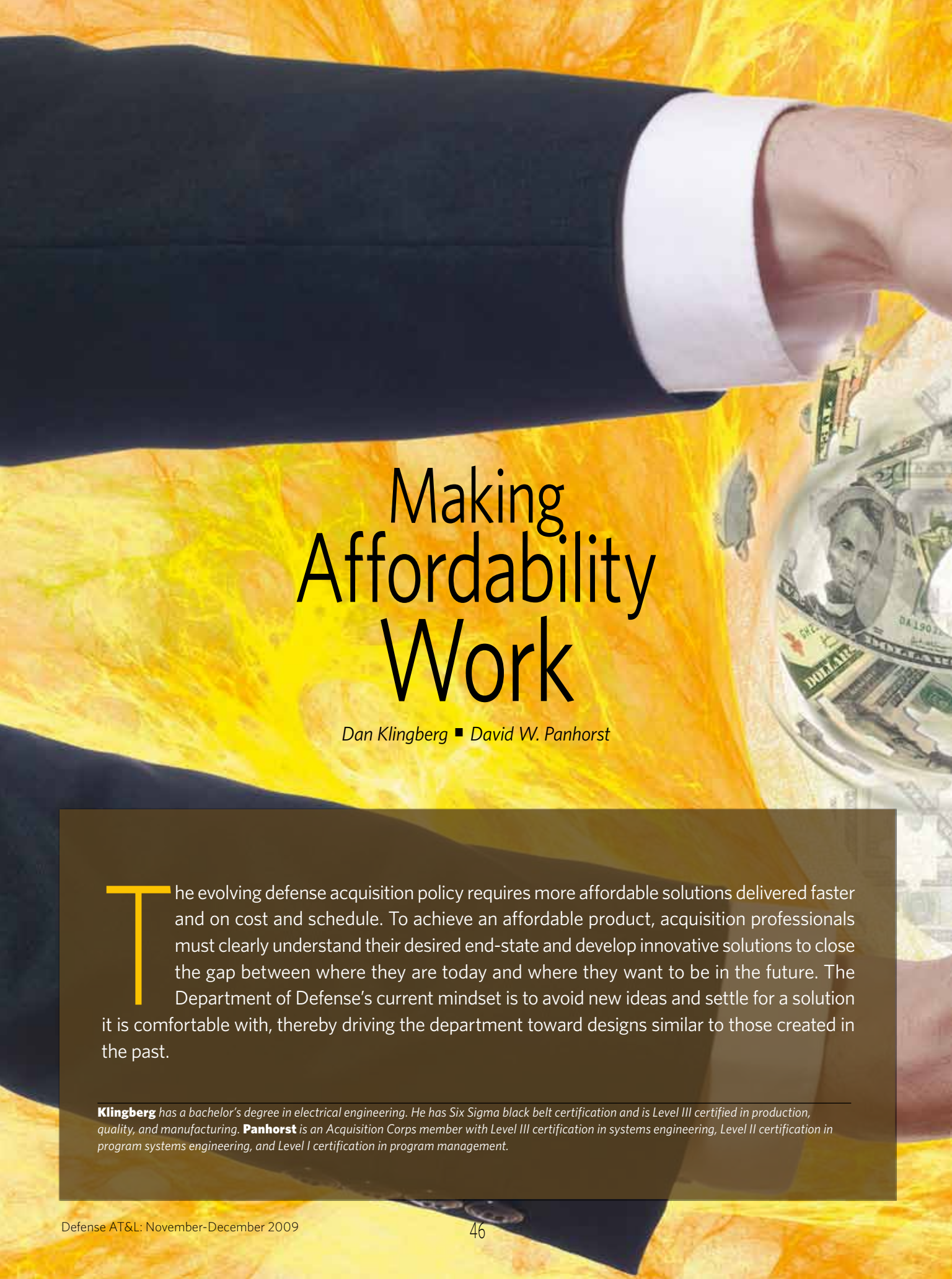
Croisetiere has an associate's degree in commercial art with a specialization in graphic design from Northern Virginia Community College and a bachelor's degree in computer graphics from George Mason University. She is currently pursuing a master's degree in instructional design from George Mason University.

combined with cross-discipline systems engineering, one can reduce the operations, maintenance, and disposal costs of a system; and that significantly reduces the total life cycle cost of a critical system. To accomplish that requires a change of mindsets and a strong investment in training and education. We graduate the best engineers from our universities, but there is no substitute for practical experience and understanding. It is easy to overlook maintenance and logistics considerations during design, permitted the designers are not familiar with those considerations. Designers need to keep their eye on the big picture and realize that almost every decision involves trades—staying off the congressional radar versus the total tax payer burden, for example.

Nunn-McCurdy is beneficial to our nation, but as most things in life, it comes with unintended consequences that must be managed by those ultimately responsible and accountable for the program cost, schedule, and performance—and on down to the lowest-level employee. Nunn-McCurdy is a beneficial element of our systems of checks and balances, protecting the taxpayer from runaway costs and forcing program managers to focus on cost and schedule performance in balance with technical performance. A Nunn-McCurdy review should include, as an essential element, the integration of systems engineering throughout a program and all of its interfaces. There must also be a documented connection elaborating on the interdependencies between cost performance, schedule performance, technical performance, and systems engineering implementation.

Proper and disciplined implementation of the systems engineering process and methodology is the most effective tool in a program manager's toolset for controlling the cost and schedule baselines as well as managing the technical baseline. Improper requirements management is a leading cause of scope creep. As a program progresses, the cost to change or add requirements becomes significantly more. It is important to remember that each change or addition must be analyzed to determine its impact on other requirements, system performance, cost, and schedule. For that reason, systems engineering must be integrated with earned value management and risk management to present the program manager with a comprehensive dashboard view of program information that is essential in making critical program decisions.

The author welcomes questions and concerns and can be contacted at dkvg@uci.edu.



Making Affordability Work

Dan Klingberg ■ *David W. Panhorst*

The evolving defense acquisition policy requires more affordable solutions delivered faster and on cost and schedule. To achieve an affordable product, acquisition professionals must clearly understand their desired end-state and develop innovative solutions to close the gap between where they are today and where they want to be in the future. The Department of Defense's current mindset is to avoid new ideas and settle for a solution it is comfortable with, thereby driving the department toward designs similar to those created in the past.

Klingberg *has a bachelor's degree in electrical engineering. He has Six Sigma black belt certification and is Level III certified in production, quality, and manufacturing.* **Panhorst** *is an Acquisition Corps member with Level III certification in systems engineering, Level II certification in program systems engineering, and Level I certification in program management.*

As a result, there is currently a silo approach to product development that focuses on getting the item to work and then making it producible. Historically, we have seen that dollars spent upfront on producibility have a much greater return than those spent later in the development cycle. Unfortunately, focusing on producibility has not been enough. Producibility pertains to optimizing the efficiency of the manufacturing processes and the associated inspection and test procedures. Affordability expands the sphere of influence and focuses on the ability to meet the user's desired number of production units at the intended cost.

The Affordability Manager

A new structure and way of thinking is necessary in order to break the current paradigm and realize the full affordability potential. The program infrastructure must be aligned to ensure affordability oversight at the level of the program management office. We propose an affordability manager at the program management office level be created. Such a role aligns well with the role of the deputy director for cost assessment, as defined in the newly approved Weapon Systems Acquisition Reform Act of 2009. The addition of an affordability manager equivalent to the chief engineer provides the necessary balance between performance and cost (see Figure 1).

The affordability approach is based on the simple foundation that the system architecture defines the system cost, and it requires systems engineering to own the cost requirement.

The affordability manager should have responsibility for the following tasks:

- Identifying potential affordability initiatives and the time-phasing of items to be implemented by the integrated product team leads
- Supervising and coordinating activities that drive the cost
- Determining the total ownership cost of the system
- Overseeing program-wide affordability initiatives
- Integrating traditionally silo activities such as:
  - Systems design
  - Design engineering
  - Systems test
  - Operations
  - Supply chain
  - Life cycle engineering
  - Program office
  - Knowledge management
  - Cost estimation.

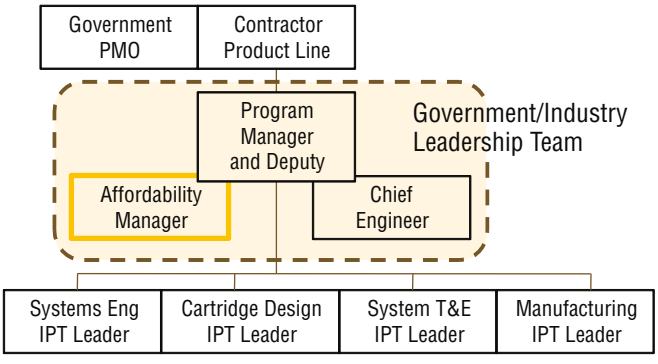
The affordability manager will ensure that affordability processes are applied across the program (system, subsystem, and module level) to the design, manufacture, and assembly efforts in order to achieve affordability targets.

Affordability Approach

The affordability approach is based on the simple foundation that the system architecture defines the system cost, and it requires systems engineering to own the cost requirement. The approach calls for systems engineering to allocate cost targets across functions that include the supply base, which is a departure from simply giving the designer a cost target and expecting that the target will be met. The Affordability Innovation Funnel (Figure 2) defines the path to a system definition that supports the cost requirement and identifies cost contributions across engineering disciplines. The Affordability Innovation Funnel approach flows cost elements to the function that can most influence the cost driver. For example, a design engineer can influence the material cost of his design but may have little insight or influence on manufacturing transportation costs. A systems-level approach to cost uses the entire value stream working together to ensure a cross-discipline approach to cost reduction.

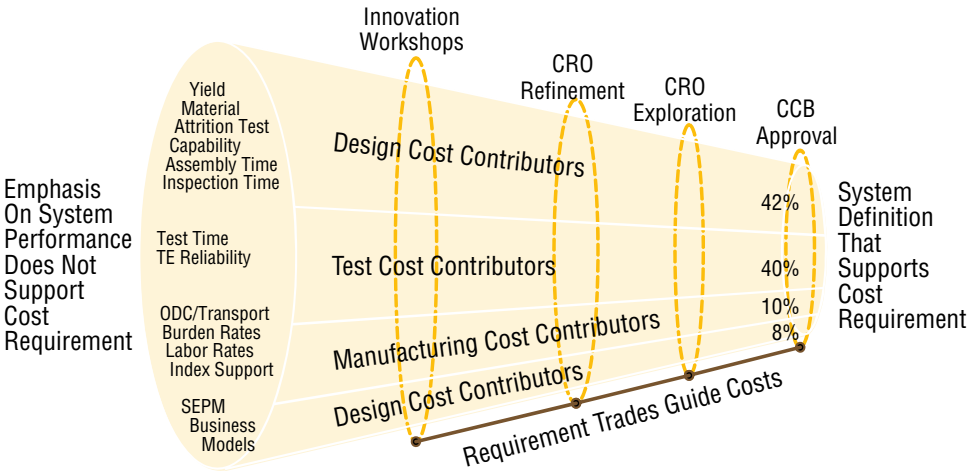
The funnel consists of four decision gates supporting projects that are more likely to succeed and sacrificing projects that are likely to fail. At a gate, a decision is made to continue working on the project, moving it along to the next stage in the funnel; to stop working on the project, shelving it for later technology maturation; or to get additional information and reconsider the project for passage through the same gate once that information becomes available. Such a structured approach enables the affordability manager to measure the progress across disciplines to ensure full potential is realized.

Figure 1. **Program Infrastructure**



Entire Structure Consists of Government/Industry Counterparts

Figure 2. **Affordability Innovation Funnel**



Implementation Enablers

The ability to meet the end-user's desired number of production units is realized through optimization of product attributes and the cost requirements, requiring input from the entire team from the beginning of the program. Trades in schedule, performance, and requirements against an established cost target provide the design team visibility into cost drivers that typically get ignored until later. To help avoid the trap of the "make it work first" and "make it producible after it works," you should:

- Know your cost requirements and understand your cost drivers
- Aggressively identify cost reduction opportunities
- Identify requirements that drive cost and flow it back to systems engineering
- Incorporate critical parameter management to match manufacturing process capability
- Make affordability part of individual development goals
- Co-develop an affordability incentive program with the stakeholders.

Identifying Cost Drivers

An effective affordability management model will define the cost requirements and document the cost components of the product assemblies and sub assemblies. It will review the baseline cost, what the cost is at the moment, the best cost, and the requirement cost. The affordability manager shall initially populate the affordability model with estimated/projected values for quantities, labor, and material prices. In order to improve cost projection accuracy, the model shall calculate cost projections based upon detailed indentured parts lists, part quantities needed, purchase options, price estimates, supplier price quotes, or actual price.

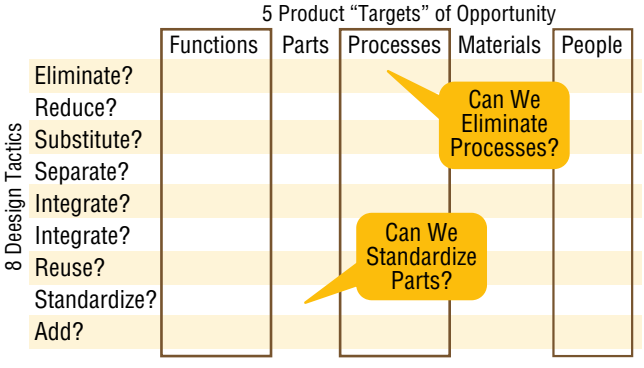
Components of cost should include labor standards and realization factors, rates and factors, support pools, and burdens. Cost should be based on Six Sigma worksheets, assembly process flows, assembly and test yields, rework attrition and scrap, batch sizes, amortized set-up costs, material allowances, and negotiation allowances. Further accuracy is ensured if the model permits the user to scale the data by applying appropriate learning curve and process yield data.

Predicted cost output data should be adjusted for fixed-year dollars based on the initiation of the pre-production test build by considering inflation and rate variations. In order to preserve the integrity of cost model comparisons, the fixed-year dollars should remain constant throughout the life of the program. As the fidelity of the model improves, estimates are replaced by quotes, and then actual costs. The model shall be updated monthly, as a minimum, to reflect the most current information. Using an affordability management model allows for the identification of the key cost drivers and leads to understanding the gaps between the current and future states.

Identifying Cost Reduction Opportunities

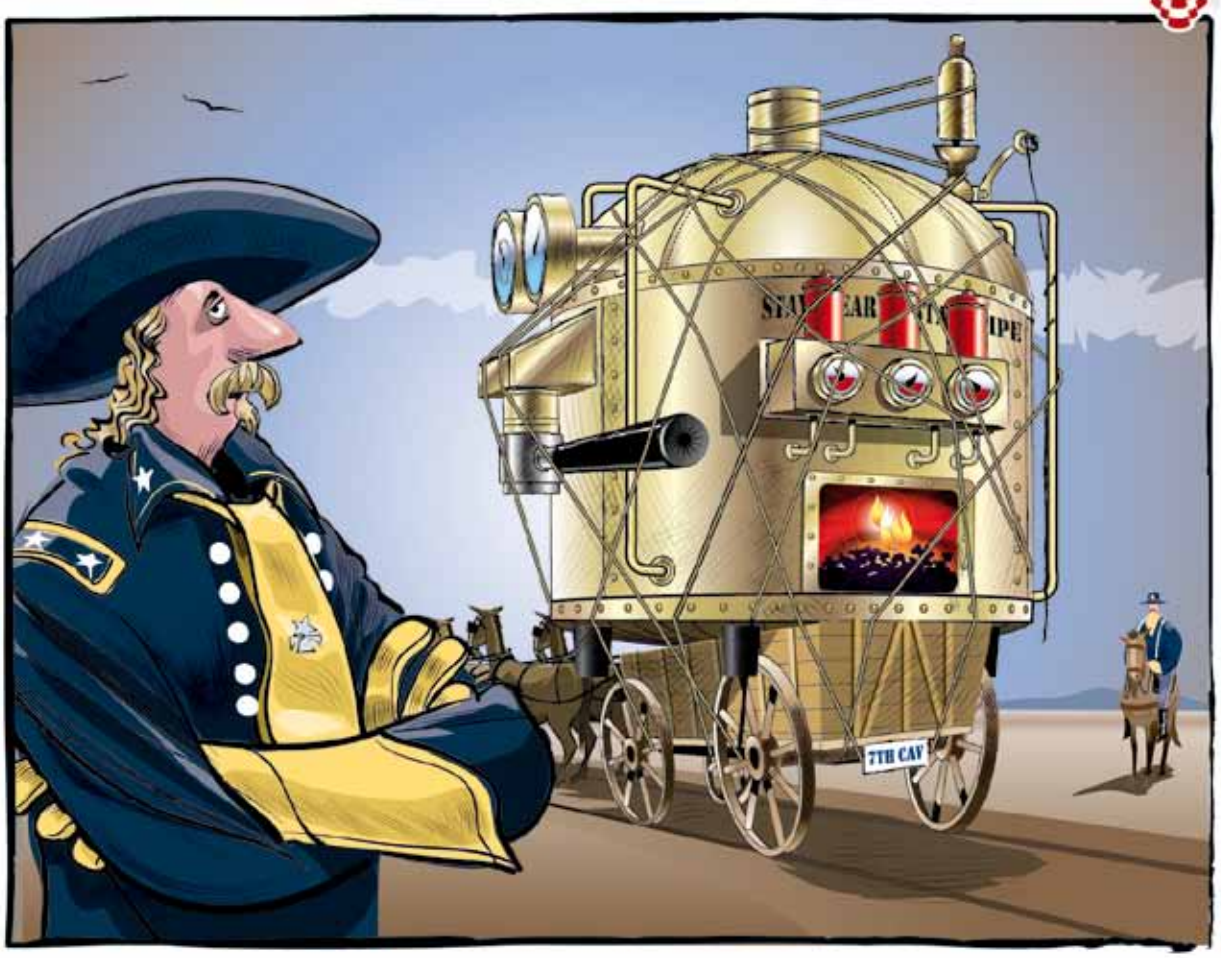
Innovation workshops can be used to capture ideas from a broad, cross-functional, multi-stakeholder team. The criteria used to consider ideas are that they close the gap between the current state and the desired end state. Such workshops can help develop tactics that will potentially eliminate, reduce, substitute, separate, integrate, re-use, standardize, or add to design techniques. Acquisition professionals can consider how the tactics will target the functions, sub-assemblies, life-cycle processes, materials, and people who use the end product. Populating the Innovation Matrix (Figure 3) with answers to the "can we?" questions helps to generate ideas. The resulting insight and idea matrix can capture ideas and consolidate them, thereby providing one with a starting point to focus his or her evaluation and maximize return on that evaluation. Evaluating the ideas against the cost drivers allows for the prioritization of their implementation as well as identification of those to be set aside, demonstrating the breadth and depth of the ideas that will eliminate waste and increase value.

Figure 3. **Innovation Matrix**



13 THETA By Dan Ward, Chris Quaid, Gabe Mounce, and Jim Elmore

GREAT MOMENTS IN ACQUISITION HISTORY



General Custer takes receipt of the Army's first steam-powered espresso machine.

Opportunity Management

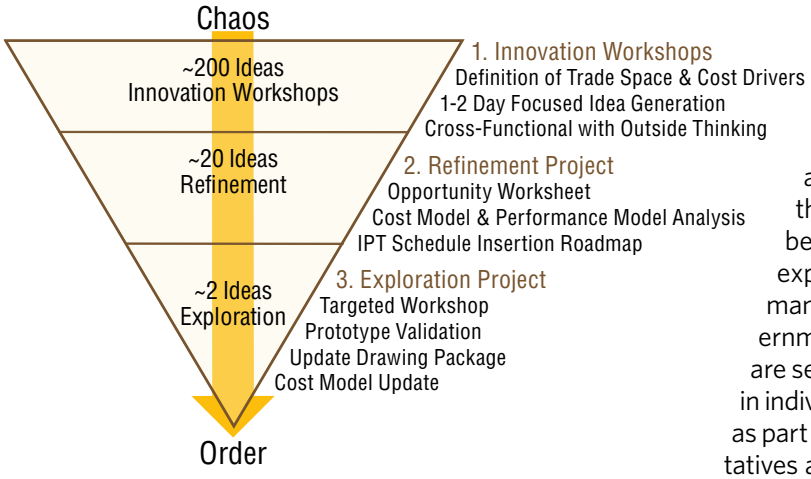
In DoD acquisitions, opportunities are pursued using a fixed budget. Funds are allocated to reduction activities based on their feasibility as determined by its benefit ratio. Progress is measured using benefit thresholds. Funding applied in this tiered approach historically leads to maximized return on investment.

Cost-reduction opportunities can be managed in the structured framework of the Opportunity Pyramid (Figure 4) and tracked in an opportunity register. They are prioritized based on their feasibility of implementation and cost benefit to the unit cost. Ideas that meet the opportunity threshold will progress to the refinement project phase upon the approval by the opportunity review board. This phase allows for the refinement of the idea to quantify the cost and performance impact and to develop a plan to insert the improvement into the design. Results from the refinement phase should be presented to the opportunity review board for approval to progress to the exploration phase. This phase includes targeted workshops using Six Sigma tools and Lean design workshops. The development of prototypes should be encouraged as part of the project verification. In addition, cost and performance models will be updated and a drawing package developed or updated. The final gate is to present the results to the change review board for incorporation in to the baseline design.

Critical Parameter Management

A robust critical parameter management process will ensure that the design has sufficient margin to be built using the factory's manufacturing processes. Such a process combines the design requirements with the process capability to minimize variation on the production floor. The early collec-

Figure 4. **Opportunity Pyramid**



tion of manufacturing variation data provides a quantitative way to focus on design and process capability interaction. The approach provides an understanding of the effects of the manufacturing process on the design and provides confidence that production processes are in control prior to a Milestone C decision.

The Price of Success

Historical data shows that the earlier in a program one applies budget to cost reduction opportunities, the more impact that budget has on final unit price. It requires setting aside program funds to ensure the budget is available to implement an affordability vision. For example, some of the successes to date of the affordability implementation on the Mid-Range Munition program include:

- First-year overall cost reduction of 40 percent
- A 35-percent reduction in the automated seeker test time
- A 14-percent cost reduction identified for seeker design
- A 30-percent material cost reduction in the Control Actuator System
- Relaxation of secondary mirror requirements due to design margin trades
- Design, tolerance, or manufacturing process parameter modifications resulting in significant improvement in manufacturing process capability.

As the reductions in the Mid-Range Munition program demonstrate, for every dollar you invest upfront, you will benefit by delivering an affordable capability to the warfighter and profitable program to the contractor.

Affordability Incentive

Government expectations are established in the statement of work, which include requirements to provide data and models to assess life cycle cost, continuous assessment of each component to identify and reduce cost drivers without compromising key performance parameters, identifying producibility ideas incorporated and the estimate savings, and summarizing ideas investigated but not incorporated and why. A significant percentage of the yearly award fee is based on meeting unit cost goals.

Understanding what motivates people to take the risk and work outside their comfort zone is the key to achieving success. We believe the acquisition professional's incentive for success is the challenge of doing something no one has done before along with the pride of meeting or exceeding expectations; however, recognition of that performance is still a key enabler. There needs to be a government recognition program. Industry expectations are set by requiring the inclusion of affordability goals in individual personal development goals and evaluated as part of the merit review cycle, and industry representatives are recognized with peer awards and gift certificates (for example). In addition, a government-industry incentive program could be developed to foster a culture uniquely aligned on affordability.

Historical data shows that the earlier in a program one applies budget to cost reduction opportunities, the more impact that budget has on final unit price.

There is a continuous balancing act between key performance parameters (customer), delivery schedule (supply base), overall development cost (design), and unit cost of the final product (operations). Changing one factor can adversely impact the others. An affordability instruction provides a structured approach to affordability based on the simple foundation that the system architecture defines the system cost. The innovative approach is for systems engineering to conduct trade studies that allow the allocation of cost targets across functions that include the supply base, which is a departure from simply giving the designer a cost target and expecting that the target will be met. The approach channels cost elements to the function that can most influence the cost driver. It uses the entire value stream and fosters a culture uniquely aligned on affordability.

The authors welcome comments and questions and can be contacted at dtklingberg@raytheon.com and david.w.panhorst@us.army.mil.

Lighten Up

Another Irreverent Look at Project Management

Wayne Turk

In "Success in Project Management: The Lighten Up Approach" (*Defense AT&L*, November-December 2005), I presented some twisted and irreverent rules that apply to project management. Since then, others have provided more "rules," and they have led to a second article. As in the first article, there is underlying truth in the rules as well as a look at the absurdity in what we do and how we think. Along with the smiles, the primary reason for the article is to remind PMs and their teams that being able to see the funny side is a necessity. Humor is a great stress reliever—and there is plenty of stress in project management; it helps us get past the unreasonable expectations, unrealistic schedules, unworkable budgets, scarce resources, and frequent crises that are part of most projects.

In a HUMOR Project (<www.humorproject.com>) article, Joel Goodman writes, "By using humor, we can prevent what I call a 'hardening of the attitudes.' If you stand rigidly in the face of stress, you are much more easily knocked off-balance. If you are flexible mentally, you are in a much better position to 'roll with the punches' that life throws you."

Turk *is an independent management consultant with Suss Consulting. He is a retired Air Force lieutenant colonel and defense contractor and the author of* Common Sense Project Management *(ASQ Press). He is a frequent contributor to* Defense AT&L.

When things appear to be going well, you have overlooked something.

Let's start with some new rules.

No major project is ever completed on time, within budget, with the same staff that started it; nor does the project do all that it is supposed to do. It is highly unlikely that yours will be the first.
Not always true, but pretty close. The PM's critical concerns are if the project is on time, within budget, and doing what it is supposed to do. Expect changes and problems. Try to be the first to prove this rule wrong.

There is a related rule: *The benefits will be smaller than initially estimated—if estimates were made at all.*
Customers and PMs have to sell their project to get funding, so they often oversell the benefits, saying the project is a panacea for all problems. Realistic benefits analyses are few and far between, and, while I hate to say it, a realistic benefits analysis might kill many projects. Do the analysis and provide some realistic expectations. If it is a worthwhile project, it will survive scrutiny.

Any project can be estimated accurately once it's completed, but few are or can be estimated correctly beforehand.
You have to try. Just make sure that everything is taken into account. Of course, you also have to remember that the same work under the same conditions will be estimated differently by 10 different estimators or by one estimator at 10 different times.

Measurable benefits are real. Intangible benefits are not measurable, thus intangible benefits are not real.
Even though the intangible benefits may be great, there are no metrics to measure them; so when you mention them in your project briefing, be prepared for someone to ask about measuring them or to pooh-pooh your statement.

One advantage of fuzzy project objectives is that they let you avoid embarrassment in estimating the corresponding costs. Corollary: *Fuzzy objectives are easier to accomplish.*
Keeping everything loose makes the PM's success rate

Defense Acquisition University

Your Online Acquisition Encyclopedia

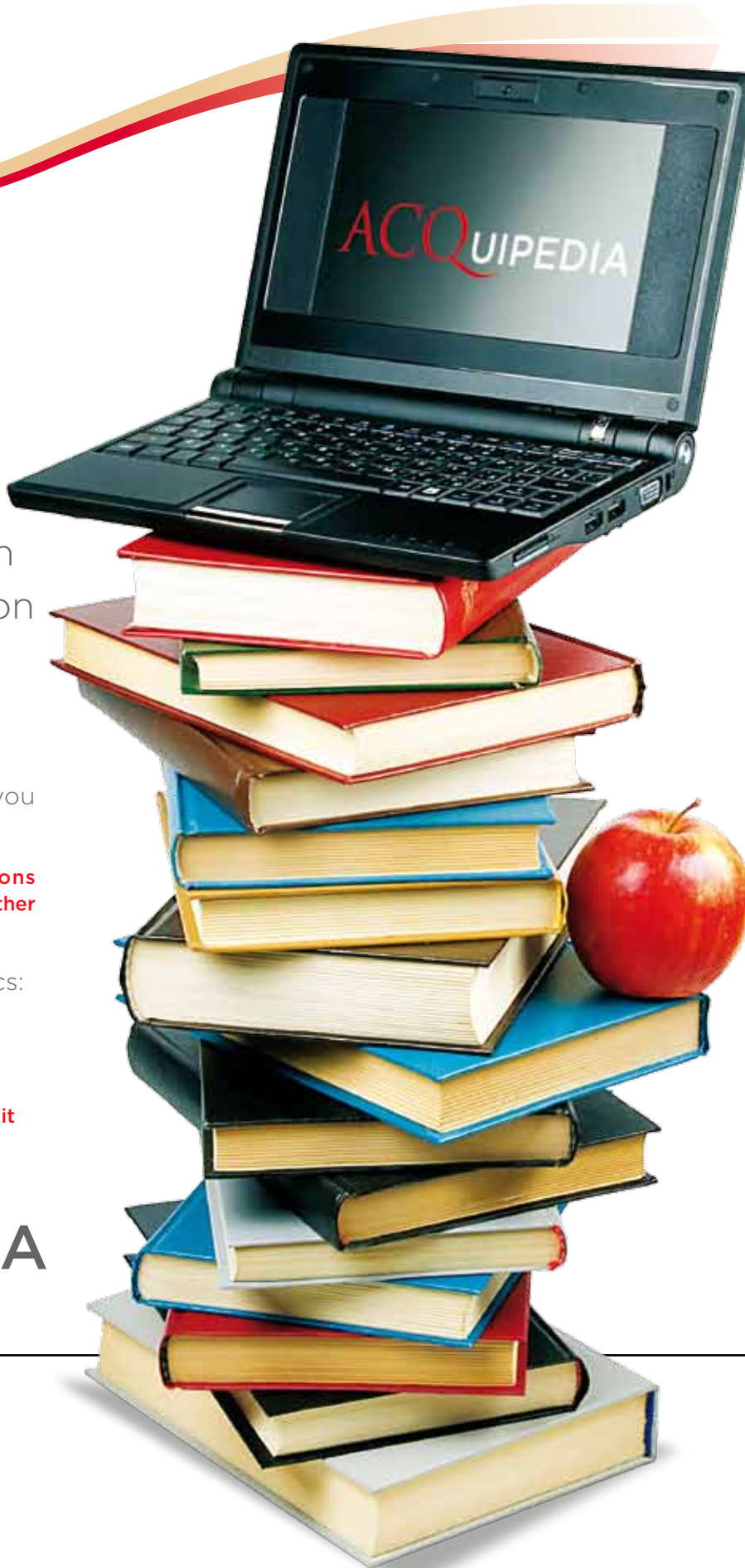
An online encyclopedia that provides the acquisition workforce with quick access to information on common acquisition topics.

Succinct online articles that provide you with knowledge you need to know:

- **Definitions and narratives**
- **Links to related policy, guidance, lessons learned, tools, communities, training, and other resources**

Your reference tool for acquisition topics:

- **Quick**
- **Concise**
- **High-value content**
- **Searchable**
- **Available 24/7—when and where you need it**



ACQUIPEDIA

HTTPS://ACQUIPEDIA.DAU.MIL

A Defense Acquisition University service for the acquisition professional.

much higher, but it is hard to get away with. In real life, most projects have objectives, and some are even clear. However, the projects and objectives don't have the clearly defined and stable requirements to go with them. That makes the budget and schedule calculations tenuous at best.

If project content is allowed to change freely, the rate of change will exceed the rate of progress.
The only kind of change that's not inevitable is change from a vending machine (OK, bad joke). Bad requirements and scope creep are two banes of a PM's existence. Most PMs would say that a change freeze is like Frosty the Snowman: a myth that melts when heat is applied. Try not to let others put the heat on to make changes. It makes your job much more difficult, if not impossible.

You can take shortcuts and get the job done, but the bitterness of poor quality lingers long after the sweetness of meeting the due date is forgotten. Don't take those shortcuts.

However clearly you write a purpose statement and objectives, what you wrote and understand will be seen differently by everyone else. Corollary: *Even if you think you have explained the purpose so clearly that no one could possibly misunderstand, someone will.*
Good communication is an elusive goal, but you have to try, try, and keep trying.

A carelessly planned project will take three times longer to complete than expected. A carefully planned project will only take twice as long.
OK, that one is exaggerated; but if you don't plan carefully, it is a guarantee that you won't make the timeline. Good planning is critical to a project's success.

When the project is going well, something will go wrong (a version of Murphy's Law). Corollary: *When things appear to be going well, you have overlooked something.*
This is a plug for a good risk management program: It can help keep the PM out of trouble (or, at least, minimize the trouble).

Anyone who can work effectively on a project part-time certainly does not have enough to do now. Corollary: *If the part-time team member has a time conflict, work assigned by the full-time boss will not suffer.*
This doesn't mean that part-timers or matrixed personnel can't be a big help to a project, so use all of the resources available to you. But be aware of their limitations.

Users are often the people who tell you what they really want the day that you give them what they asked for originally.
Another way to say it is that the user does not know what he wants until he gets it, then he knows what he *doesn't* want. If users are involved from the start and all the way through, there's a smaller chance that will happen and a greater chance of project success.

You can take shortcuts and get the job done, but the bitterness of poor quality lingers long after the sweetness of meeting the due date is forgotten.
Don't take those shortcuts.

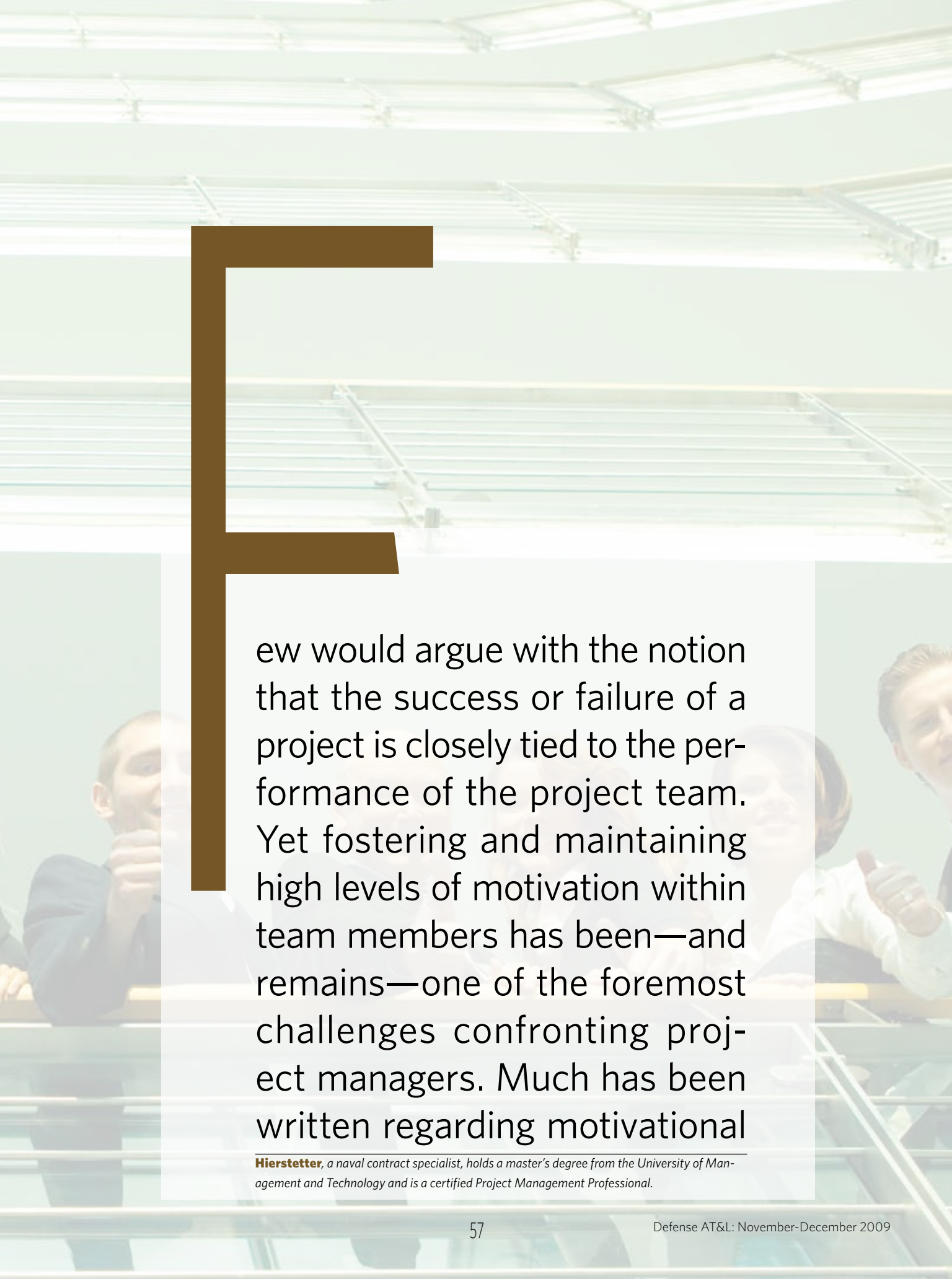
Now, for good measure, let's wrap up with some oldies but goodies.

- If anything can go wrong it will (Murphy's Law).
- If it can't possibly go wrong, it still will (O'Malley's corollary to Murphy's Law).
- Murphy and O'Malley are optimists (Zook's Law).
- When it goes wrong, it will do so in the worst possible way (Sod's Law).
- Work expands to fill the time available for its completion (Parkinson's Law).
- A two-year project will take three years; a three-year project will never finish (Turk's Law).
- The more time you spend in reporting on what you are doing, the less time you have to do anything. Stability is achieved when you spend all your time doing nothing but reporting on the nothing you are doing (Cohn's Law).
- Project managers will not get the staff they need as long as they succeed through overtime, ulcers, and super-human effort. Only when deadlines are missed will senior management approve the staff who, had they been available at the outset, would have prevented the missed deadlines (Woehlke's Law).
- There is nothing more difficult to take in hand, more perilous to conduct, or more uncertain in its success, than to take the lead in the introduction of a new order of things. Because the innovator has for enemies all those who have done well under the old conditions, and lukewarm defenders in those who may do well under the new (Niccolò Machiavelli's Law, c.1505).

The author welcomes comments and questions and can be contacted at **rwturk@aol.com** or **wayne.turk@sussconsulting.com**.

The Motivated Project Team

Brad Hierstetter



Few would argue with the notion that the success or failure of a project is closely tied to the performance of the project team. Yet fostering and maintaining high levels of motivation within team members has been—and remains—one of the foremost challenges confronting project managers. Much has been written regarding motivational

Hierstetter, *a naval contract specialist, holds a master's degree from the University of Management and Technology and is a certified Project Management Professional.*

theory. To further complicate matters, some motivational theories clearly contradict others, and a manager's ability to motivate is, to no small degree, related to his or her leadership approach and interpersonal skills. One thing is certain, though: workforce and workplace dynamics are such that there is no one-size-fits-all approach to motivating team members.

It is very important to recognize that motivation is an intrinsic phenomenon. According to noted industrial psychologist Frederick Herzberg, "Extrinsic satisfaction only leads to movements, not motivation." Motivated team members, on the other hand, possess an internal drive that causes them to consistently direct high levels of effort toward completing their project assignments.

Motivated team members possess an internal drive that causes them to consistently direct high levels of effort toward completing their project assignments.

Getting to Know You

Obviously then, it behooves us, as project managers, to do everything in our power to foster as much motivation as possible within each of our team members. The challenge, of course, is how to accomplish this. My suggestions are to make a sincere attempt to get to know each of your team members; create a comfortable working environment; familiarize yourself with the key motivators suggested by common motivational theories; and then attempt to apply the proper theory (or theories) when working with individual team members.

A common mistake that many new, and some veteran, project managers make is to obtain much of their information about their team from sources other than the team members themselves. Worse yet, many formulate opinions of team members based exclusively on these secondary sources. Do not make this error! The result will be that your team members will perceive you as being aloof or apathetic. Besides, the information you are given may be inaccurate or incomplete. After being assigned to a new project, communicate directly with each of your team members early and often. Do not be afraid to ask what motivates them. This initial communication will help you develop a general understanding of their responsibilities, their workload, and the manner in which they approach their work.

Maintaining Contact

After you have made initial contact with your team members, continue working to create a comfortable project environment. Always maintain an open-door policy. Encourage team members to communicate with you. Visit their workspaces on a regular basis, and talk to them about whatever seems appropriate at the time. Remember, the topic of discussion does not always have to be business-related. The point is to maintain open and honest lines of communication. Share your visions with them frequently. Seek input from your team members. Hear them out, and do not belittle their concerns.

As your knowledge of your team increases, you will naturally uncover factors that may be impacting both their motivation levels and the manner in which they respond to your attempts to motivate them. It will become clear to you that individual motivation levels are affected by many factors, professional and personal. Some team members intrinsically lack motivation. Others may have been highly motivated at one time but are no longer. Remember, team members are likely to respond differently to different motivational techniques. Some may not respond at all. You will be able to address some factors; others will far exceed your sphere of influence.

Motivational Theories

Motivational theories are generally categorized as "content" and "process." Content theories examine factors within individuals that stimulate, inspire, and stop behavior. Process theories, on the other hand, consider how individuals make decisions and how rewards influence future performance. What follow are some key motivators stemming from common content theories and common process theories (derived from *The Human Aspects of Project Management: Human Resource Skills for the Project Manager, Volume Two*, by Vijay Verma).

Content Theories of Motivation

Content theories of motivation examine factors within individuals that stimulate, inspire, and stop behavior.

Achievement Theory (David C. McClelland)

Team members can be motivated by:

- Suitable role models
- Empowerment
- Financial incentives that match level of achievement
- Regular, constructive feedback.

Hierarchy of Needs (Abraham H. Maslow)

Team members can be motivated by:

- A comfortable, participative, and safe project environment
- Challenging assignments
- Recognition for exceptional performance.

Motivator/Hygiene Theory (Frederick Herzberg)
Herzberg believed that motivators such as the following can increase job satisfaction:
- Challenging assignments
- Increased responsibility
- The possibility of achievement, advancement, personal growth, or recognition.

Herzberg also believed that factors such as compensation, level of supervision, relationships with coworkers and superiors, and working conditions do not always foster motivation; however, not providing them can create job dissatisfaction.

Process Theories of Motivation
Process theories of motivation consider how individuals make decisions and how rewards influence future performance.

Contingency Theory (John J. Morse and Jay W. Lorsch)
Team members can be motivated when:
- The tasks they are expected to perform align well to their individual skills
- The degree of freedom granted them by management, as characterized by the formality of their work environment, and the degree to which they are empowered matches the type of work being done.

When team members' skill sets are not sufficient for the job-at-hand, they should be provided training that will enhance their overall competence.

Equity Theory (John S. Adams)
Team members' motivation can be influenced by the perception of how fairly rewards are distributed throughout the organization. Unfair allocation of rewards, whether actual or perceived, can negatively impact team member motivation.

Expectancy Theory (Victor H. Vroom)
Team members may exhibit greater effort when they feel that this effort will result in a favorable outcome or a desired reward. Implicit, here, is the notion that people give serious thought to how much effort they wish to expend before performing a task.

Goal-Setting Theory (Gary P. Latham and Edwin A. Locke)
Team members can be motivated by goals that are both precise and challenging. A participative approach to goal formulation that includes project team members can foster greater team member commitment toward achieving goals.

Individual motivation levels are affected by many factors, professional and personal.

Reinforcement Theory (based on B. F. Skinner's behavior modification theories)
Team members can be motivated when desirable behaviors are encouraged (using positive reinforcements) by providing them with incentives that they value. Examples of incentives include:
- Access to better equipment
- Challenging assignments
- Increased independence
- Job promotions
- Sincere praise.

Undesirable behaviors can be discouraged by punishment.

Theory X and Theory Y (Douglas McGregor)
Theory X promulgates the notion that team members will follow the path of least resistance and are largely motivated by money, punishment, or station.

Theory Y, on the other, generally assumes that team members are committed to organizational goals, are self-disciplined, desire increased responsibility, and will meet expectations if properly motivated and afforded a supportive work environment.

Most project team members fit Theory Y assumptions.

Theory Z (William G. Ouchi)
Similar to the Theory Y managers described by McGregor, Theory Z managers generally trust their team members. Managers can foster increased levels of motivation and productivity by exhibiting high levels of confidence, commitment, and trust in project team members.

Preventing Human Failure
Motivating project team members can be challenging. After all, team members work and live in a dynamic environment. Always remember, though, that most project failures are rooted in human failure. For this reason, people (including team members) should be the single most important concern of project managers. While motivation is just one factor in the human side of project management, it is an important factor. I hope, this article has provided practical advice that you, the project manager, can use to foster and maintain high levels of motivation within your team members.

The author welcomes comments and questions and can be contacted at brad.hierstetter@navy.mil.

Defense AT&L Receives Two Awards

Defense AT&L magazine was recently honored with an APEX 2009 Award for Publication Excellence and an International Association of Business Communicators (IABC) 2009 Silver Inkwell Award of Merit.

"APEX awards are based on excellence in graphic design, editorial content and the ability to achieve overall communications excellence," according to a statement from Communications Concepts®, which sponsored the APEX Award.

The Washington, D.C., chapter of IABC sponsored the Silver Inkwell Award. *Defense AT&L* magazine was honored in the category of Government and Military Communications.

The magazine's staff consists of Managing Editor Carol A. Scheina; Art Director Paula Croisetiere; contributing editors Christina Cavoli, Judith M. Greig, and Collie J. Johnson; and contributing graphic artist Jim Elmore.

FIST Packs a Punch at *Defense AT&L* Meet-the-Author Event

Judith M. Greig

"In World War II, the Bazooka went from the drawing board to the battlefield in 30 days. Each one cost $19 and put an unprecedented amount of firepower into the infantry's hands. General Eisenhower listed the Bazooka as one of the four weapons that won the war for the allies," said Air Force Maj. Dan Ward on July 29 to a Meet-the-Author audience that included DAU senior leadership, faculty, and staff; employees of other agencies; and journalists.

In a fast-paced, entertaining, and thought-provoking presentation that subsequently attracted attention at the congressional level, Ward and his co-presenter, Air Force Maj. Gabe Mounce, presented FIST (Fast, Inexpensive, Simple, Tiny), a concept they believe could—and should—streamline present-day defense acquisition, reducing cost overruns and speeding development cycles.

History, said Ward and Mounce, shows that FIST works. They also cited (among other examples) the C-130 transport aircraft, which went from general operating requirement to delivery in five years; and the F-16 fighter, which was half the cost, half the weight, and half the size of the F-15; and was developed in half the time.

"But unfortunately, the broader story of defense technology development doesn't often sound like those

Maj. Dan Ward (left) and Maj. Gabe Mounce speak on FIST at the *Defense AT&L* Meet-the-Author speaking event.

examples," said Mounce. "If you look at DoD's most troubled programs, you'll find their leaders thought the price, the size, and the complexity of each system were indications of sophistication and desirability." He cited the Navy's A-12 Avenger II stealth bomber; the Army's Comanche helicopter; and the Air Force's on-again, off-again B-1 bomber.

Ward and Mounce said that one of the main problems in defense acquisition is the unFISTy myth of not enough—not enough time, money, or resources. A project gets into trouble and the official answer is to throw more money, time, and people at it. Ward and Mounce went on to show the folly and inadvisability of this approach, quoting from Government Accountability Office reports, the Packard Commission, the Air Force Acquisition Improvement Plan, the Defense Acquisition Performance Assessment report, the Standish Group, and other authorities.

"Restraint is what's needed," said Ward. "But the current environment rewards the opposite of restraint. It's better for my career to lead a cast of thousands and spend billions of dollars building a hugely complex system on an endless schedule, than to lead a small team and rapidly develop an inexpensive, simple system that gets fielded quickly."

Mounce agreed, saying, "Instead of rewarding restraint, we encourage and reward programmatic gluttony. Being FISTy probably means putting our careers on the line."

Ward and Mouce believe the defense technology community could exercise restraint if it really wanted to—even if that means sacrifice on the part of the project leaders in terms of less power, prestige, or promotion.

How do we make that happen?

"Any time you have to make a decision that involves choosing between alternatives, go for the option that is faster, cheaper, simpler, and smaller," said Mounce.

"FIST is all about small numbers of people, operating below the radar and relying on teamwork instead of paperwork to quickly develop and deliver innovative systems that the warfighters need and the taxpayers can afford," said Ward.

A videotape of the presentation can be seen at <http://view.dau.mil/dauvideo/view/eventListing.jhtml?eventid=2261&refresh=true>.

Greig is a contributing editor and the former executive editor of Defense AT&L.

FROM OUR READERS

Insights and Best Practices

I would like to compliment Anita K. Blair for her fine article, "Defense Acquisition Human Capital Challenges and Opportunities," which appeared in the July-August 2009 issue of *Defense AT&L* magazine. It provided very good insight.

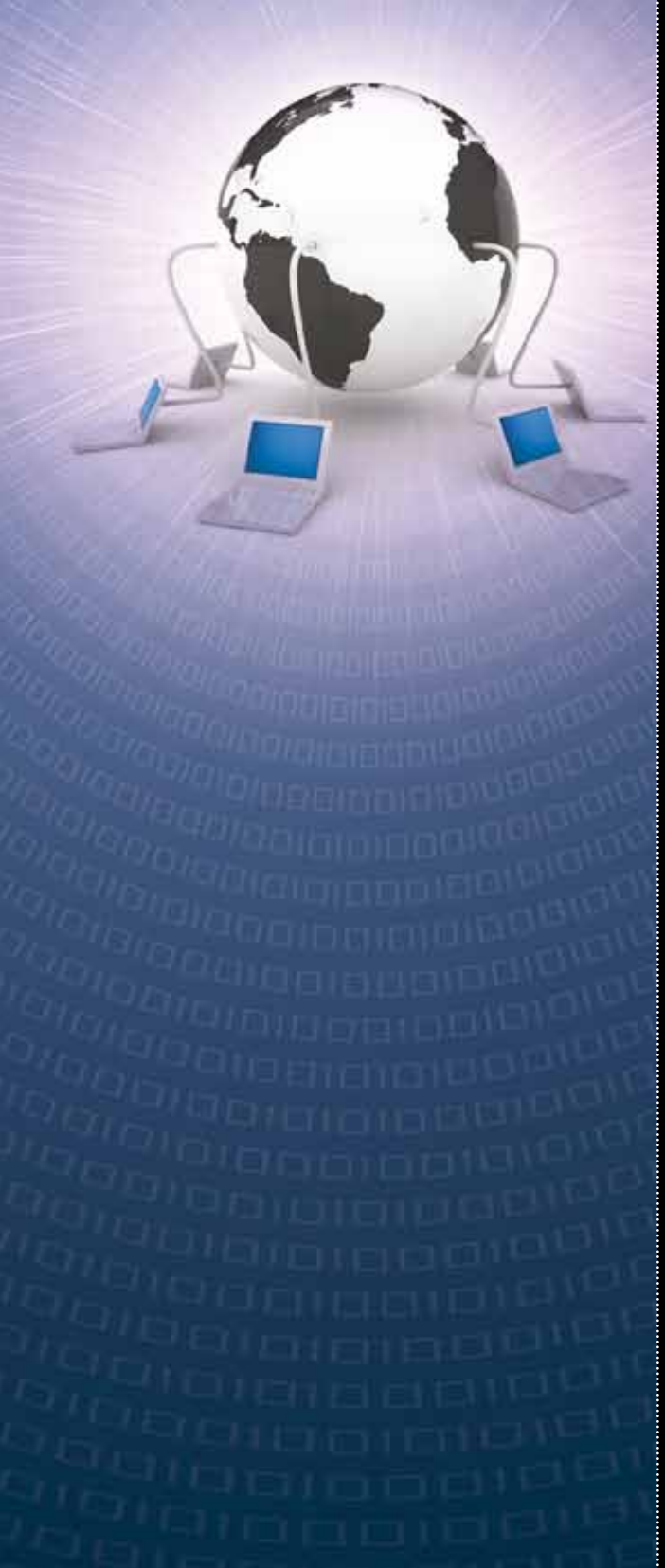
I especially liked the part of the article that asked why workers work. I have long thought that the so-called pay-for-performance systems consider only the carrot or the stick in trying to encourage workers toward better performance. People are, as you point out, much more complex than that.

I would also like to praise Christopher R. Paparone for his article, "From Not-So-Great to Worse: The Myth of Best Practices Methodologies," also appearing in the July-August 2009 issue of the magazine.

Over my government career, I have seen repeatedly where industry "best practices" have been adopted by the government, the latest being the pay-for-performance methodology. I've always wondered how practices that apparently work in private industry could work in the government, which has no profit motive, no stock options, and no perks such as company cars.

I actually read the book *Good to Great* a number of years ago and had forgotten the specific list of companies which were deemed as "great." My thanks to the Mr. Paparone for bringing readers up to date on the status of these companies. "Great" really can't be considered great if greatness is only temporary. I seem to recall that the only company in the Dow Jones average that has been there from the beginning is G.E. Companies rise and fall, but the federal government has been faithfully servicing its customers for over 230 years.

Al Kaniss
Naval Air Systems Command



Defense Acquisition Portal

Online Performance Support for the Acquisition Professional

What is the Defense Acquisition Portal?

It's a single point of entry for applications in the Acquisition Knowledge Management System, expanding upon and replacing the Acquisition Knowledge Sharing System.

You can use the Defense Acquisition Portal to:

- *Meet your training, education, and on-the-job support needs*
- *Address the elements and forces of the Big Acquisition process*
- *Gain information relevant to the DoD workforce and Industry partners, through execution of the Big Acquisition process acquisition policy*
- *Receive support throughout the milieu of the acquisition process*
- *Search and find information with the ACQuire Search format!*

Defense Acquisition Portal
Acquisition • Requirements • PPBE

Start using the Defense Acquisition Portal today!
https://dap.dau.mil

Let us know what you think!

We like happy readers! That's why we want to know what you think! Your feedback will ensure we continue to produce a magazine that is interesting and relevant to your job. Simply answer the responses, fold the paper in half, and stick it in the mail. All responses are anonymous and will be used only to improve *Defense AT&L*'s services.

Please rate the overall quality of the magazine.

❑ Exceptional ❑ Great ❑ Good ❑ Fair ❑ Poor

Please rate the design of the publication.

❑ Exceptional ❑ Great ❑ Good ❑ Fair ❑ Poor

Please select yes or no to the following statements:

This publication is easy to read.	❑ Yes ❑ No
This publication is useful to my career.	❑ Yes ❑ No
This publication contributes to my job effectiveness.	❑ Yes ❑ No
I read most of this publication.	❑ Yes ❑ No
I recommend this publication to others in the acquisition field.	❑ Yes ❑ No

How do you usually obtain your copy of the magazine?

❑ Through the mail ❑ Borrow from a colleague ❑ Defense Acquisition University Web site

Are there any themes or topics you would like to see covered more often in the magazine?

_____

_____

Are there any themes or topics you would like to see covered less often in the magazine?

_____

_____

Are there any other comments you'd like to provide?

_____

_____

_____

Defense AT&L

Fold Here

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 12 FORT BELVOIR, VA

POSTAGE WILL BE PAID BY ADDRESSEE

DEPARTMENT OF DEFENSE
DEFENSE ACQUISITION UNIVERSITY
ATTN DAU PRESS
9820 BELVOIR ROAD
SUITE 3
FT BELVOIR VA 22060-9989

Defense AT&L FREE SUBSCRIPTION

Thank you for your interest in *Defense AT&L* magazine. To receive your complimentary subscription, please answer all questions below—incomplete forms cannot be processed. This form can also be used to obtain a complimentary subscription of *Defense Acquisition Review Journal*, or to cancel your magazine/journal subscription.

☐ **New Subscription**

Please indicate the number of copies you'd like to receive.

☐ ***Defense AT&L Magazine***

☐ ***Defense Acquisition Review Journal***

☐ **Cancellation**

☐ **Change of Address**

E-mail this form to **datl(at)dau(dot)mil**
or mail to
9820 Belvoir Road, Suite 3
ATTN: DAU Press
Fort Belvoir, VA 22060-5565

DATE

LAST NAME

FIRST NAME

STREET ADDRESS

CITY

STATE, PROVINCE, OR TERRITORY

ZIP/POSTAL CODE

☐ USA ☐ OTHER (Please provide)

COUNTRY

☐ *Please check here if this is your business address.*

DAY/WORK PHONE

E-MAIL ADDRESS

If you are submitting this form to alert us of a change in your mailing address, please provide the complete mailing address of your prior subscription form on the above line.

Privacy Policy. *If you provide us your business address, you may become part of mailing lists we are required to provide to other agencies who request the lists as public information under the Freedom of Information Act. If you prefer not to be part of these lists, use your home address. Please do not include your rank, grade, military service, or other personal identifiers. Your phone and e-mail address will only be used to verify subscription information and will not be provided to any third parties.*

Fold Here

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 12 FORT BELVOIR, VA

POSTAGE WILL BE PAID BY ADDRESSEE

DEPARTMENT OF DEFENSE
DEFENSE ACQUISITION UNIVERSITY
ATTN DAU PRESS
9820 BELVOIR ROAD
SUITE 3
FT BELVOIR VA 22060-9989

Acquisition & Logistics Excellence

An Internet Listing Tailored to the Professional Acquisition Workforce

Surfing the Net

ACQuipedia
https://acquipedia.dau.mil
Online encyclopedia that provides the acquisition workforce with quick access to information on common acquisition topics.

Acquisition Central
http://acquisition.gov
Shared systems and tools to support the federal acquisition community and business partners.

Acquisition Community Connection
http://acc.dau.mil
Policies, procedures, tools, references, publications, Web links, and lessons learned for risk management, contracting, system engineering, TOC.

Aging Systems Sustainment and Enabling Technologies
http://asset.okstate.edu
Government-academic-industry partnership. ASSET program-developed technologies and processes expand the DoD supply base, reduce time and cost of parts procurement, enhance military readiness.

Air Force (Acquisition)
www.safaq.hq.af.mil
Policy; career development and training opportunities; reducing TOC; library; links.

Air Force Institute of Technology
www.afit.edu
Graduate degree programs and certificates in engineering and management; Civilian Institution; Center for Systems Engineering; Centers of Excellence; distance learning.

Air Force Materiel Command Contracting Laboratory's FARSite
http://farsite.hill.af.mil
FAR search tool; *Commerce Business Daily* announcements (CBDNet); *Federal Register*, electronic forms library.

Army Acquisition Support Center
http://asc.army.mil
News; policy; *Army AL&T* Magazine; programs; career information; events; training opportunities.

Army Training Requirements and Resources System
https://www.atrrs.army.mil
Army system of record for managing training requirements.

Assistant Secretary of the Army (Acquisition, Logistics & Technology)
https://www.alt.army.mil
ACAT Listing; ASA(ALT) Bulletin; digital documents library; links to other Army acquisition sites.

Association for the Advancement of Cost Engineering International
www.aacei.org
Planning and management of cost and schedules; online technical library; bookstore; technical development; distance learning.

Association of Old Crows
https://www.myaoc.org
News; conventions, courses; *Journal of Electronic Defense*.

Association of Procurement Technical Assistance Centers
www.aptac-us.org
PTACs nationwide assist businesses with government contracting issues.

Best Practices Clearinghouse
https://bpch.dau.mil
The authoritative source for acquisition best practices in DoD and industry. Connects communities of practice, centers of excellence, academic and industry sources, and practitioners.

Central Contractor Registry
http://www.ccr.gov
Registration for businesses wishing to do business with the federal government under a FAR-based contract.

Committee for Purchase from People Who are Blind or Severely Disabled
www.abilityone.gov
Information and guidance to federal customers on the requirements of the Javits-Wagner-O'Day (JWOD) Act.

Defense Acquisition Portal
https://dap.dau.mil
One-stop source for acquisition information and tools.

Defense Acquisition University and Defense Systems Management College
www.dau.mil
DAU iCatalog; DAU/DSMC course schedules; educational resources; and *Defense AT&L* magazine and *Defense Acquisition Review Journal*.

DAU Alumni Association
www.dauaa.org
Acquisition tools and resources; links; career opportunities; member forums.

Defense Advanced Research Projects Agency
www.darpa.mil
News releases; current solicitations; *Doing Business with DARPA*.

Defense Information Systems Agency
www.disa.mil
Defense Information System Network; Defense Message System; Global Command and Control System.

Defense Modeling and Simulation Coordination Office
http://www.msco.mil
DoD modeling and simulation master plan; document library; events; services.

Defense Spectrum Organization
http://www.disa.mil/dso/
Operational spectrum management support to the Joint Staff and COCOMs; conducts R&D into spectrum-efficient technologies.

Defense Technical Information Center
www.dtic.mil
DTIC's scientific and technical information network (STINET) is one of DoD's largest available repositories of scientific, research, and engineering information. Hosts over 100 DoD Web sites.

Department of Commerce, Defense Priorities and Allocations System
www.bis.doc.gov/dpas
DPAS regulation, policies, procedures, and training resources.

Deputy Chief Management Officer
http://www.defenselink.mil/dcmo/index.html
Information on the Defense Business Transformation Agency and the DoD Performance Improvement Officer.

Deputy Under Secretary of Defense for Acquisition and Technology
www.acq.osd.mil/at
Acquisition and technology organization, goals, initiatives, and upcoming events.

Director, Defense Procurement and Acquisition Policy
www.acq.osd.mil/dpap
Procurement and acquisition policy news and events; reference library; acquisition education and training policy, guidance.

DoD Defense Standardization Program
www.dsp.dla.mil
DoD standardization; points of contact; FAQs; military specifications and standards; newsletters; training; nongovernment standards; links.

DoD Enterprise Software Initiative
www.esi.mil
Joint project to implement true software enterprise management process within DoD.

DoD Inspector General Publications
http://www.dodig.mil/PUBS/index.html
Audit and evaluation reports; IG testimony; planned and ongoing audit projects of interest to the AT&L community.

DoD Office of Technology Transition
www.acq.osd.mil/ott
Information about and links to OTT's programs.

DoD Systems Engineering
http://www.acq.osd.mil/sse
Policies, guides and information on SE and related topics, including developmental T&E and acquisition program support.

Earned Value Management
www.acq.osd.mil/pm
Implementation of EVM; latest policy changes; standards; international developments.

Electronic Industries Alliance
www.eia.org
Government relations department; links to issues councils; market research assistance.

FAIR Institute
http://www.thefairinstitute.org
Organization that promotes a federal acquisition system that continually innovates, exceeds world class standards of performance, and ensures the prudent use of taxpayer dollars.

Federal Acquisition Institute
www.fai.gov
Virtual campus for learning opportunities; information access and performance support.

Federal Acquisition Jumpstation
http://prod.nais.nasa.gov/pub/fedproc/home.html
Procurement and acquisition servers by contracting activity; CBDNet; reference library.

Federal Aviation Administration
http://fast.faa.gov
Online policy and guidance for all aspects of the acquisition process.

Federal Business Opportunities
www.fedbizopps.gov
Single government point-of-entry for federal government procurement opportunities over $25,000.

Federal R&D Project Summaries
http://www.osti.gov/fedrnd
Portal to information on federal research projects; search databases at different agencies.

Acquisition & Logistics Excellence

An Internet Listing Tailored to the Professional Acquisition Workforce

Surfing the Net

Fedworld Information
www.fedworld.gov
Central access point for searching, locating, ordering, and acquiring government and business information.

Government Accountability Office
http://gao.gov
GAO reports;policy and guidance; FAQs.

General Services Administration
www.gsa.gov
Online shopping for commercial items to support government interests.

Government-Industry Data Exchange Program
http://www.gidep.org
Federally funded co-op of government-industry participants, providing electronic forum to exchange technical information essential to life cycle development.

Integrated Dual-Use Commercial Companies
www.idcc.org
Information for technology-rich commercial companies on doing business with the federal government.

International Society of Logistics
www.sole.org
Online desk references that link to logistics problem-solving advice; Certified Professional Logistician certification.

International Test & Evaluation Association
www.itea.org
Professional association to further development and application of T&E policy and techniques to assess effectiveness, reliability, and safety of new and existing systems and products.

Joint Capability Technology Demonstrations
www.acq.osd.mil/jctd
JCTD's accomplishments, articles, speeches, guidelines, and POCs.

Joint Interoperability Test Command
http://jitc.fhu.disa.mil
Policies and procedures for interoperability certification; lessons learned; support.

Library of Congress
www.loc.gov
Research services; Copyright Office; FAQs.

MANPRINT (Manpower and Personnel Integration)
www.manprint.army.mil
Points of contact for program managers; relevant regulations; policy letters from the Army Acquisition Executive; briefings on the MANPRINT program.

NASA's Commercial Technology Office
http://technology.grc.nasa.gov
Promotes competitiveness of U.S. industry through commercial use of NASA technologies and expertise.

National Contract Management Association
www.ncmahq.org
Educational products catalog; publications; career center.

National Defense Industrial Association
www.ndia.org
Association news; events; government policy; *National Defense* magazine.

National Geospatial-Intelligence Agency
www.nima.mil
Imagery; maps and geodata; Freedom of Information Act resources; publications.

National Institute of Standards and Technology
http://www.nist.gov
Information about NIST technology, measurements, and standards programs, products, and services.

National Technical Information Service
www.ntis.gov
Online service for purchasing technical reports, computer products, videotapes, audiocassettes.

Naval Air Systems Command
www.navair.navy.mil
Provides advanced warfare technology through the efforts of a seamless, integrated, worldwide network of aviation technology experts.

Naval Research Laboratory
http://www.nrl.navy.mil
Navy and Marine Corps corporate research laboratory. Conducts scientific research, technology, and advanced development.

Naval Sea Systems Command
www.navsea.navy.mil
TOC; documentation and policy; reduction plan; implementation timeline; TOC reporting templates; FAQs.

Navy Research, Development, and Acquisition
http://acquisition.navy.mil/rda
Policy documents; career management; Acquisition One Source page, providing links to acquisition communities of practice.

Office of Naval Research
http://www.onr.navy.mil
News and announcements; publications and regulations; technical reports; doing business with the Navy.

Open Systems Joint Task Force
www.acq.osd.mil/osjtf
Open systems education and training opportunities; studies and assessments; projects, initiatives and plans; library.

Parts Standardization and Management Committee
www.dscc.dla.mil/programs/psmc
Collaborative effort between government and industry for parts management and standardization through commonality of parts and processes.

Performance-Based Logistics Toolkit
https://acc.dau.mil/pbltoolkit
Web-based 12-step process model for development, implementation, and management of PBL strategies.

Project Management Institute
http://www.pmi.org
Program management publications; information resources; professional practices; career certification.

Small Business Administration
www.sba.gov
Communications network for small businesses.

DoD Office of Small Business Programs
www.acq.osd.mil/osbp
Program and process information; current solicitations; Help Desk information.

Software Engineering Institute (SEI)
www.sei.cmu.edu
Advances software engineering principles and practices as well as computer security, and process improvements.

Software Program Managers Network
www.spmn.com
Supports project managers, software practitioners, and government contractors. Contains publications on highly effective software development best practices.

Space and Naval Warfare Systems Command
https://e-commerce.sscno.nmci.navy.mil
SPAWAR business opportunities; acquisition news; solicitations; small business information.

System of Systems Engineering Center of Excellence
www.sosece.org
Advances the development, evolution, practice, and application of the system of systems engineering discipline across individual and enterprise-wide systems.

Under Secretary of Defense for Acquisition, Technology and Logistics
www.acq.osd.mil
USD(AT&L) documents; streaming videos; links.

U.S. Coast Guard
www.uscg.mil
News and current events; services; points of contact; FAQs.

U.S. Department of Transportation Maritime Administration
www.marad.dot.gov
Information and guidance on the requirements for shipping cargo on U.S. flag vessels.

Links current at press time. To add a non-commercial defense acquisition/acquisition and logistics-related Web site to this list, or to update your current listing, please e-mail your request to datl(at)dau.mil. Your description may be edited and/or shortened. DAU encourages the reciprocal linking of its home page to other interested agencies. Contact: webmaster(at)dau.mil.

Defense AT&L Writer's Guidelines in Brief

Purpose

Defense AT&L is a bi-monthly magazine published by DAU Press, Defense Acquisition University, for senior military personnel, civilians, defense contractors, and defense industry professionals in program management and the acquisition, technology, and logistics workforce. The magazine provides information on policies, trends, events, and current thinking regarding program management and the acquisition, technology, and logistics workforce.

Submission Procedures

Submit articles by e-mail to datl(at)dau.mil or on disk to: DAU Press, ATTN: Carol Scheina, 9820 Belvoir Rd., Suite 3, Fort Belvoir VA 22060-5565. Submissions must include the author's name, mailing address, office phone number, e-mail address, and fax number.

Receipt of your submission will be acknowledged in five working days. You will be notified of our publication decision in two to three weeks.

Deadlines

Issue	Author Deadline
January-February	1 October
March-April	1 December
May-June	1 February
July-August	1 April
September-October	1 June
November-December	1 August

If the magazine fills before the author deadline, submissions are considered for the following issue.

Audience

Defense AT&L readers are mainly acquisition professionals serving in career positions covered by the Defense Acquisition Workforce Improvement Act (DAWIA) or industry equivalent.

Style

Defense AT&L prints feature stories focusing on real people and events. The magazine also seeks articles that reflect your experiences and observations rather than pages of researched information.

The magazine does not print academic papers; fact sheets; technical papers; white papers; or articles with footnotes, endnotes, or references. Manuscripts meeting any of those criteria are more suited to DAU's journal, *Acquisition Review Journal (ARJ)*.

Defense AT&L does not reprint from other publications. Please do not submit manuscripts that have appeared in print elsewhere. *Defense AT&L* does not publish endorsements of products for sale.

Length

Articles should be 1,500 – 2,500 words.

Format

Submissions should be sent via e-mail as a Microsoft® Word attachment.

Graphics

Do not embed photographs or charts in the manuscript. Digital files of photos or graphics should be sent as e-mail attachments or mailed on CDs (see address above). Each figure or chart must be saved as a separate file in the original software format in which it was created.

TIF or JPEG files must have a resolution of 300 pixels per inch; enhanced resolutions are not acceptable; images downloaded from the Web are not of adequate quality for reproduction. Detailed tables and charts are not accepted for publication because they will be illegible when reduced to fit at most one-third of a magazine page.

Non-Department of Defense photos and graphics are printed only with written permission from the source. It is the author's responsibility to obtain and submit permission with the article.

Author Information

Contact and biographical information will be included with each article selected for publication in *Defense AT&L*. Please include the following information with your submission: name, position title, department, institution, address, phone number, and e-mail address. Also, please supply a short biographical statement, not to exceed 25 words, in a separate file. We do not print author bio photographs.

Copyright

All published *Defense AT&L* articles require a signed Work of the U.S. Government/Copyright Release form, available at <www.dau.mil/pubscats/pages/defenseatl.aspx>. Click "Submit an Article" to obtain the form. Please print and complete in full the form, sign it, and fax it to 703-805-2917, ATTN: *Defense AT&L*.

Alternatively, you may submit a written release from the major command (normally the public affairs office) indicating the author is releasing the article to *Defense AT&L* for publication without restriction.

The Defense Acquisition University does not accept copyrighted material for publication in *Defense AT&L*. Articles will be given consideration only if they are unrestricted. This is in keeping with the university's policy that our publications should be fully accessible to the public without restriction. All articles are in the public domain and posted to the university's Web site at <www.dau.mil>.

www.dau.mil/pubscats/pages/defenseatl.aspx

Learn. Perform. Succeed.