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Defense

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Schedule or Event Driven?

*How Do
I Know?*



**What Does It Mean
to Be “a Defense
Acquisition
Professional”?**

**By the Under Secretary of
Defense for Acquisition,
Technology and Logistics**

**What Happened
to DT&E?**

**Let's Fix This Red
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**ALSO:
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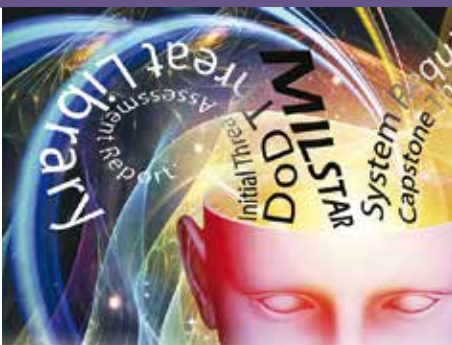


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What Does It Mean to Be "a Defense Acquisition Professional"?

Frank Kendall



One of the seven goals of Better Buying Power 2.0 is to improve the professionalism of the total acquisition workforce. I thought it might be useful to provide some specificity about what I have in mind when I talk about professionalism. The following is based on various experiences over my career, including some formal education on the nature of professionalism in the military, including at venues like West Point and the Army War College, in my on-the-job training in program management and systems engineering by various Air Force colonels in the Ballistic Missile Office, and by mentors in the Army's Ballistic Missile Defense Systems Command. I don't intend this to be an academic discussion, however, but a hands-on practical application of the term "professional" in the context of defense acquisition.

Defense acquisition professionals have a special body of knowledge and experience that is not easily acquired. Other professions such as attorneys, physicians, and military officers also have this characteristic. The situation for defense acquisition professionals is analogous. This characteristic applies equally to professionals in program management, engineering, contracting, test and evaluation, and product support, to name our most obvious examples. One should no more expect a lay person to make good judgments about something in these acquisition fields—be it a program structure, a risk mitigation approach, or the incentive structure of a contract—than one would expect an amateur to tell a lawyer how to argue a case, or a brain surgeon how to do an operation, or a brigade commander how to organize an attack. No one should expect an amateur without acquisition experience to be able to exercise professional judgments in acquisition without the years of training and experience it takes to learn the field. Like these other highly skilled professions, our expertise sets us apart.

Defense acquisition professionals set the standards for members of the profession. One of the reasons we are establishing

"qualification boards" for our various key senior leader fields is to infuse a greater element of this characteristic into our workforce. Our senior professionals should know better than anyone else what it takes to be successful as a key acquisition leader. A professional career-field board will make the determination, in a "peer review" context, whether an individual has the experience, education, training, and demonstrated talent to accept responsibility for the success of all, or a major aspect of, a multibillion dollar program. This is not a minor responsibility. These new boards are an experiment at this stage, but I am hopeful that they will take on a large share of the responsibility for enhancing and sustaining the expected level of preparation and performance of our key leaders. The boards will be joint, so that our professional standards are high and uniform across the defense Services and agencies. Setting standards for other members of the profession also encompasses the development and mentoring responsibilities that leaders at all levels, including AEs, PEOs, and other acquisition leaders, take on to strengthen and maintain the profession. They know that their most important legacy is a stronger—and more professional—workforce than the one they inherited.


Defense acquisition professionals know how to deal with complexity. The problems we have to solve are not simple—we are developing and fielding some of the most complicated and technically advanced systems and technologies in military history. It is therefore an illusion to believe that defense acquisition success is just a matter of applying the right, easily learned "cookbook" or "checklist" approach to doing our jobs. There are no fixed rules that apply to all situations, and as professionals we know that a deeper level of comprehension is needed to understand how to make good decisions about such issues as technical risk mitigation, what incentives will best improve industry's performance, what it will take to ensure that a product is mature enough to enter production, or how much testing is needed to verify compliance with a requirement. It is not enough to know acquisition best practices; acquisition professionals must understand the "why" behind the best practices—that is, the underlying principles at play. Many of our products consist of thousands of parts and millions of lines of code. They must satisfy hundreds of requirements, and it takes several years to bring them into production. Understanding and managing complexity is central to our work.

Defense acquisition professionals embrace a culture of continuous improvement. The concept of continuous improvement should apply to our own capabilities as individuals, to the teams we lead, to the processes we create and manage, and to the acquisition outcomes we seek. Better Buying Power is built on the idea of continuous improvement, of measuring performance, of setting targets for improving that performance, and striving to reach them ("should cost" for example). We are willing to examine our own results and think critically about where we can achieve more, and we have the courage

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acquisition experience
to be able to exercise
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and character to learn from our mistakes and to implement constantly ideas for better performance. As leaders we encourage these behaviors in the people who work for us and who collaborate with us.

Defense acquisition professionals practice and require ethical standards of behavior and conduct. Our ethical values guide how we interact with one another, with our supervisors, with industry, and with stakeholders including the public, media, and Congress. An Under Secretary whom I worked for decades ago told me once that when you lose your credibility you have nothing left—and you won't get it back. We must speak truth to power about problems within our programs and about ill-advised guidance that will lead to poor results. Successful acquisition requires a culture of "telling bad news fast," and that values accountability without a "shoot the messenger" mentality. Finally, it is particularly important that we treat industry fairly and with complete transparency.

I hope that this doesn't all come across as either preachy or aspirational. I believe that these are realistic expectations for defense acquisition professionals. I believe that they go a long way to defining what being a professional really means. My West Point class (1971) motto is "Professionally Done." I have always thought that this is a pretty good motto, and a pretty good way to look back on a successful career or a completed project, including in defense acquisition. 



24TH INTERNATIONAL IDEAA

Defense Educational and Acquisition Arrangement SEMINAR April 14-16, 2014

The 24th International Defense Educational and Acquisition Arrangement (IDEAA) Seminar will be held at the Defense Acquisition University campus, Fort Belvoir, Va.

The theme this year is "International Acquisition Programs: Benefits, Future—How Do We Train for Success?" The seminar will be a theme-based format, with selected U.S. government, foreign, and industry seminar panels, and will provide for individual participation and positive information exchange and feedback. The seminar is sponsored by IDEAA, which consists of defense acquisition and/or educational institutional representatives from the United States, United Kingdom, Germany, France, Spain, Sweden and Australia.

Attendees are drawn from employees of defense departments and ministries, the academic community and defense industries of the seven sponsoring nations that are actively engaged in international defense acquisition and training programs. Many other nations participate by invitation, and representatives of many additional countries are expected to attend this year.

Contact a DAU IDEAA team member for additional seminar information:
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Updated information can be found on an IDEAA Web site:
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Schedule or Event Driven?

How Do I Know?

Mark Husband, Dr.Eng.



Acquisition professionals know that program schedules should be established via “event-driven” planning. But what is the distinction between a schedule- versus an event-driven program? The author proposes that schedule-driven programs are distinguished not by whether they are behind schedule or have little margin, but by how management sets and controls schedules.

Schedules for event-driven programs are created by mapping out the entire set of activities that must be accomplished and determining their reasonable durations, while considering linkages and interdependencies between activities. In other words, an event-driven schedule is “built-up” by considering the time required to accomplish all the program’s activities. In contrast, a program can be considered “schedule driven” if, for a fixed content, the schedule is determined and event durations are established based on fixed time constraints associated with the project’s deliverables. One can conceive of schedule-driven programs in two categories: programs in which time constraints are imposed from the outset, and those in which revised time constraints are imposed during execution

Husband is the senior advisor for root cause analyses in the Office of the Under Secretary of Defense for Acquisition, Technology and Logistics, Performance Assessments and Root Cause Analyses. He is a retired Air Force officer with a doctorate in chemical engineering from Germany’s Karlsruhe Institute of Technology. He is grateful to Gary Bliss, Bob Jennings, Mike Ginter, John Mueller and Ed McDermott for helpful discussions and for providing examples of schedule-driven practices they have observed.

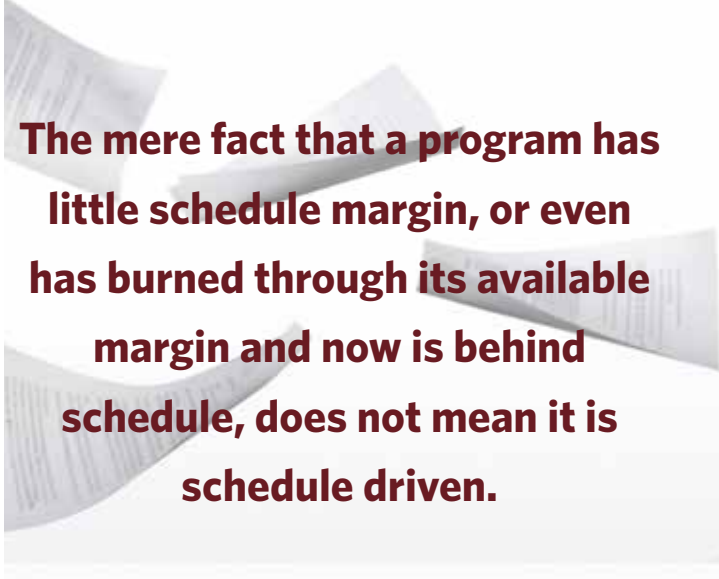
to “buy back” schedule slips or respond to externally imposed mandates. While the contrast between event- and schedule-driven programs is clear in theory, in practice all programs are subjected to fixed time constraints; otherwise each issue encountered would result in schedule slips corresponding to the time required to resolve that issue. Program managers (PMs) must continuously challenge their teams and industry partners to execute on schedule, even (or especially) when issues arise.

“Good” Versus “Bad” Schedule Goals

How might one distinguish between “bad” schedule-driven practices that harm programs and “good,” aggressive program management that yields more efficiency and productivity? Schedule goals can be thought of as having one of two broad purposes: They are established either to ensure a given capability is delivered in accordance with a fixed timeline (e.g., the warfighter requires the system by a certain date or mission failure will result), or they are established based on considered planning and used as a management and status tool to ensure effective program execution. While actual schedule goals generally have a combination of these purposes, considering them separately allows one to make a value judgment: Goals established to accomplish a given content within a fixed timeline are “bad,” as they yield a schedule-driven program. Such “bad” schedule goals may be imposed at program initiation (e.g., to meet a delivery timeline), or may be imposed on a well-planned program during execution as a response to schedule slips or externally imposed stimuli, thereby changing the program’s character from event- to schedule-driven.

Of course, a fixed fielding date may be imposed on a program for legitimate reasons. During his tenure as Under Secretary of Defense for Acquisition, Technology and Logistics (USD[AT&L]), Dr. Ashton Carter said PMs sometimes need to consider a deadline as inviolable: “Think of it like a NASA planetary probe that has to rendezvous with the planet in 2017; if you don’t make that date you have to wait another 50,000 years.” Meeting treaty requirements is an example of a timeline that may be externally imposed on Department of Defense (DoD) programs (e.g., the Assembled Chemical Weapons Assessment program). Carter’s Sept. 14, 2010, Better Buying Power memo decried “the leisurely 10–15 year schedule of even the simplest and least ambitious Department programs” and included an Initiative to “Manage Program Timelines.” Negative consequences of extended program schedules are documented: substantial cost growth, late delivery of capability to the warfighter, and delivery of outdated technology and capabilities.

Just because a program is required to deliver capability on a fixed timeline does not automatically make it schedule-driven. Based on DoD’s evolutionary acquisition construct, acquisition professionals should make trades between cost, schedule and performance to design programs delivering blocks of capability that satisfy needs incrementally, meeting users’ timelines with an intermediate capability if full capability is unachievable. Also, in the author’s view, the mere fact that a program has



The mere fact that a program has little schedule margin, or even has burned through its available margin and now is behind schedule, does not mean it is schedule driven.

little schedule margin, or even has burned through its available margin and now is behind schedule, does not mean it is schedule driven. A schedule-driven program is one in which, for a fixed content, time constraints established for the deliverables are used to establish durations of the project’s activities.

Establishing Dates for Program Deliverables

If a program were purely event driven, dates established for fielding its capability would be determined based on the system’s performance requirements and the associated required development and production times. In practice, DoD programs never are structured with such unconstrained fielding timelines. Instead, programs compete for initiation via the Planning, Programming, Budgeting and Execution (PPBE) system; those programs with the most urgent requirements to fill a capability gap or replace a legacy system are selected for funding in the president’s budget. Other prospective programs must wait until their associated need becomes more “urgent.” That programs are selected for initiation based on a process in which “urgency” provides a competitive advantage is a hint that the programs selected likely have an inherent schedule-driven character. This “self-selection of the most urgent programs for initiation” phenomenon might be a good screening criterion for identifying schedule-driven programs. Programs promoted as the most urgent by the Service or Component are most likely to be schedule driven.

Ironically, some programs that are promoted as urgent and designed with a schedule-driven acquisition strategy don’t appear in hindsight to have been as urgent as advertised. For instance, the Air Force and the Navy have commendably found ways to extend the service life of their tactical air fleets in the face of delays in the F-35 program, and the Army similarly has accommodated cancellation of the Comanche Helicopter and the Armed Reconnaissance Helicopter (ARH) through modifications and upgrades of its existing helicopter fleets. The Air Force tanker program was believed to be extremely urgent in the early 2000s, with claims that legacy tankers would soon “fall out of the sky”



and that rising operations and maintenance costs of aging aircraft represented a crisis. Neither claim proved true; the latter was disproven by the Air Force's own analysis. None of this implies that recapitalization and introduction of new and advanced capabilities are not vital to military effectiveness—because they are. However, programs designed with a schedule-driven acquisition strategy are much likelier to experience cost and schedule growth than if they are designed based on event-driven principles.

Before the 2009 Weapon Systems Acquisition Reform Act, DoD's institutional incentives favored adopting an optimistic program baseline. Doing so allowed the DoD to initiate more programs with its given resources, and some officials believed that adopting a challenging baseline put pressure on the program to execute more efficiently. However, there is a difference between being aggressive and being unrealistic. Being aggressive can be good: It challenges people to put forth their best efforts and ideas, to innovate, and to engage in continuous process improvement. However, aggressive but unrealistic goals frequently have negative consequences. They may cause people to take ill-advised shortcuts or give less than their best effort, because "the expectations are impossible anyway."

Schedule Compression

During a recent Defense Acquisition Executive Summary (DAES) review, USD(AT&L) Frank Kendall was briefed on a DoD Business System program that had encountered a 4-month slip of its contract award date. Rather than extend the period of performance to account for the delayed contract award, the program compressed its remaining schedule, which pressured the contractor to complete activities 4 months earlier than originally scheduled. Was this an example of schedule-driven behavior? Or good, aggressive program management?

In discussing the situation with the PM, the author learned that schedule pressures came not from acquisition leadership

but from functional sponsors whose users are counting on the capability. According to the PM, the program was "schedule driven, with deliveries based on a schedule that wasn't executable." Stakeholders outside the program office argued that because the program baseline was issued before the contract award, extending the schedule would have necessitated changing the established baseline. To an acquisition professional, compressing a schedule as a result of a late contract award seems foolish—a clear indication of schedule-driven behavior. However, from the functional community's perspective, they have an approved capability requirement with an associated fixed timeline—in this case, the system is a part of efforts to achieve auditability in accordance with congressionally mandated timelines. In short, different interests and expectations among stakeholders lead to different perspectives about the best course of action (COA). Acquisition professionals are responsible for advocating COAs that posture the program for success, while recognizing that external stakeholder considerations (e.g., user-needs, policy, congressional or public interest concerns) may trump acquisition rationales.

While there are times when delivery dates are inviolable (rendezvousing with a planet) and times when external stakeholder considerations carry the day, acquisition professionals should recognize indicators of schedule-driven programs and advocate for event-driven strategies. The next section describes examples of programs initiated with schedule-driven constraints, while the following section discusses indicators that a program with an event-driven plan has adopted schedule-driven strategies in response to schedule slips or external mandates.

Constraints Imposed at Program Initiation

As an analyst in the Cost Analysis Improvement Group (CAIG) of the Office of the Secretary of Defense (OSD), the author observed several programs that appeared to be schedule driven at initiation. By far the most frustrating were instances in which knowledgeable program office personnel—e.g., engineers, cost analysts, contracting specialists and PMs—acknowledged privately that the planned program schedule was too optimistic, but explained that "their leadership" required it to be done that fast. During discussion of the cost estimates, analysts in the OSD often described the program as "schedule driven" or "overly optimistic," while the Service analyst described it as "aggressive" or "success oriented." A few examples will show how decision makers, with good intentions, can negatively influence a program through the desire to deliver capability faster.

In 2005, during initiation of the ARH, which was intended to replace the Bell OH-58 Kiowa helicopter, the program management team presented a plan to Army leadership to conduct a relatively rapid development effort of approximately 3 years (from Milestone [MS] B to MS C). Army leadership was not satisfied that the timeline adequately met warfighters' needs and pushed for faster fielding. Ultimately, the program was baselined in July 2005 with a 20-month development plan—much faster than any helicopter development program

in the CAIG database. In October 2008, the ARH program was terminated following multiple schedule breaches and cost breaches exceeding 40 percent. To date, despite several attempts, the Army has not initiated a follow-on replacement program for the OH-58.

Also in 2005, the Presidential Helicopter VH-71 program was baselined based on the Navy's cost position, which predicted a significantly shorter timeframe for development than the CAIG estimate. According to a 2011 Government Accountability Office report, VH-71 was "knowingly initiated with a high-risk business case ... the Navy adopted a two-step acquisition approach and initiated production at the same time it began development ... the program had a high-risk schedule because of concurrent design and production efforts." As with ARH, senior decision makers had good intentions to replace aging VH-3D and VH-60N helicopters and meet extremely challenging requirements on a very streamlined timeline. According to the 2007 Selected Acquisition Report by the program office, "The Increment 1 strategy purposely acknowledged a high schedule risk to meet urgent needs for safe and reliable Presidential transport." They could just as well have written "this program is schedule driven with an extremely low probability of success." VH-71 was canceled after an expenditure of nearly \$3 billion and multiple schedule and cost breaches, and a follow-on program has yet to be initiated.

In the nonattribution environment of Defense Acquisition University, PMs frequently share experiences describing how unrealistic expectations are imposed on them by leaders or external stakeholders. The author has heard variations of the same story many times: A cost estimate and corresponding acquisition strategy are presented to flag officers or senior executives during the program initiation process, and the PM is given two great pieces of management wisdom: Lower the estimate and shorten the program timeline. In one particularly vivid example, a PM recounted how, during restructuring of the Space-Based Infrared System-High satellite surveillance program after its critical Nunn-McCurdy breach, the Secretary of the Air Force was presented three COAs and chose the one that had a 3 percent confidence level—i.e., a 3 percent chance of coming in at or below cost. According to program office personnel, the Secretary had been assured by a senior industry official that the aggressive launch date could be met. The bet didn't pay off, as the program experienced another schedule breach and was rebaselined.

Migrating from Event- to Schedule-Driven

Programs originally planned and initiated based on event-driven principles may become schedule-driven in response to delays or external mandates. The author proposes that indicators of schedule-driven behavior for such programs fall into one of several categories, skipping steps (or compressing the time for those steps); slipping content to the right, or adding content without appropriately recognizing schedule consequences.

"The Increment 1 strategy purposely acknowledged a high schedule risk to meet urgent needs for safe and reliable Presidential transport." They could just as well have written "this program is schedule driven with an extremely low probability of success."

The possibilities for engaging in schedule-driven behavior by skipping or compressing steps is limited only by one's imagination. Some examples:

- Curtailing tests
- Lowering standards or specifications (for products or processes)
- Increasing concurrency (concurrency may be planned at program initiation or may be introduced during execution in response to issues or mandates)
- Cutting analyses or assessments
- Reducing or eliminating reviews or oversight functions, including quality assurance or inspections
- Deleting or delaying reliability, cost-reduction, or sustainability efforts

Again, a few actual program examples will suffice to demonstrate schedule-driven behaviors.

Curtailing Tests. The Joint Tactical Radio System (JTRS) Handheld, Manpack and Small Form (HMS) Rifleman Radio (RR) program encountered unexpectedly poor reliability during Governmental Developmental Testing (GDT) that caused it to fall behind schedule and complete only 33 percent of the GDT that was planned to support the Initial Operational Test and Evaluation (IOT&E) readiness assessment. As a result, the Deputy Assistant Secretary of Defense for Developmental Test and Engineering DASD(DT&E) recommended the program resolve reliability issues and complete GDT before entering IOT&E. However, the program's IOT&E was part of a large Network Integration Exercise (NIE) involving multiple systems and operational units. Completing GDT and resolving the reliability issues would have required obtaining revised commitments from the test range and operational units, both of which are difficult to schedule. The absence of JTRS-HMS RR also would have negatively affected the planned NIE, which was created to test compatibility and interoperability of multiple



systems. As a result, Army decision makers chose to proceed to IOT&E before completing GDT and, not surprisingly, poor reliability was one of the findings in the resulting assessment by the director, OT&E. In recognition that recommendations based on poor DT results often are too late to affect decisions to enter IOT&E (because IOT&E budgets are set, ranges are reserved and operational units engaged), the ODASD(DT&E) has initiated efforts to obtain quality DT information earlier, to provide better, more timely information to decision makers.

Lowering Process Standards. The Capability Maturity Model Integration (CMMI) is a set of standards developed by Carnegie Mellon University, originally as a guide to software development, but more recently applied to assess business processes. During a discussion at DAU, a PM described how, after encountering schedule challenges, a program relaxed the required CMMI standards for software development, to speed up the work and regain schedule. If applying CMMI standards has value when the program is conceived and planned, then relaxing or rescinding those standards when the program encounters schedule challenges is clearly a sign of a schedule-driven program.

Increasing Concurrency. The VH-71 Kestrel Helicopter and F-35 jet fighter programs are examples in which excessive concurrency was part of a program's original acquisition strategy, making the programs schedule driven from the outset. The GAO Schedule Assessment Guide (May 2012) says "a schedule that contains many concurrent activities, unrealistic activity durations or logic, or a significant number of constrained start or finish dates is a common indicator of poor program performance." Alternatively, a program may become schedule driven by increasing concurrency of its activities. A program's schedule may be compressed as a result of well-intentioned efforts to improve efficiency, such as through Should Cost management. The CH-53K and B-2 Defensive Management System (DMS) programs developed plans to deliver capability


sooner by compressing their schedules based on Should Cost approaches. However, their efforts were unsuccessful for different reasons—technical challenges prevented CH-53K from compressing its time to first flight and completing IOT&E as planned, while B-2 DMS had to lengthen its desired schedule because of near-term funding constraints.

Slipping Content. This may indicate schedule-driven behavior. In some cases, slipping content indicates good management—e.g., when intractable issues are encountered and the PM has authority to make trades between cost, schedule and performance. In other cases, slipping content indicates poor management, such as when delivered products don't meet user needs. Because it may occur for legitimate reasons, content slippage alone does not equate to schedule-driven behavior. Some instances in which content slippage may be associated with schedule-driven behavior include:

- Proceeding to IOT&E with nonproduction representative articles
- Executing tasks out of sequence in an attempt to maintain schedule, even when doing so results in significant scrap, rework or retrofits.

Adding Content Without Recognizing Schedule Consequences. You don't need much experience, just common sense, to realize that adding content to a program without adding schedule would be foolish. However, when content is added (be it "requirements creep" or an increase in program scale), it opens the opportunity for schedule-driven behaviors of the types already described—i.e., at initiation via the imposition of fixed timelines, or during execution whereby the consequences of the added content are not appropriately recognized. Program examples familiar to the author tend to involve disconnects or misunderstandings between the government and contractor concerning exactly what the added content entails. In such cases, the schedule consequences were arguably recognized by the government but inadequately communicated to the contractor or translated into contractually binding documents.

Conclusions

Schedule slips are important in assessing a program's progress and performance. However, schedule slips alone are not evidence of "schedule-driven" programs. Slips could be due to variations inherent in schedule estimation and the simple fact that "stuff happens." Instead, the author asserts that schedule-driven behavior is more specific: It consists of goal-setting choices management makes as programs are planned and initiated or while programs are executed. A program can be considered schedule driven if (1) its schedule is mandated at initiation; (2) it attempts to accelerate or "buy-back" schedule by compressing or skipping activities; (3) it detrimentally slips content solely to maintain schedule; or (4) it adds content without adding schedule. 

The author can be reached at david.m.husband.civ@mail.mil.

What Happened to DT&E?

Steve Hutchison, Ph.D.



The office now responsible for overseeing *developmental* test and evaluation (DT&E) was created four decades ago to oversee *all* test and evaluation (T&E) in the Department of Defense (DoD). In the January-February 2014 issue of *Defense AT&L* magazine, I described David Packard's response to the Blue Ribbon Defense Panel in shaping the original office in the Office of the Secretary of Defense (OSD) responsible for T&E oversight. In this article, I describe the DoD's efforts over the past 40 years to shape T&E oversight organizations to help improve acquisition outcomes. Ultimately, this article is intended to provoke a rethinking of how we, as testers and as members of the acquisition community, can better help programs provide enhanced capabilities to our warfighters in an effective and timely manner. If that is not our top priority, then I think we may be in the wrong business.

Hutchison previously served as the principal deputy for developmental test and evaluation in the Office of the Secretary of Defense.

The key to improving acquisition outcomes is to properly set the conditions to begin production. Said another way, improving outcomes is not about increasing the pass rate for initial operational test and evaluation (IOT&E) or the number of programs that get to full-rate production (FRP), because those numbers can be very high yet require significant post-production costs to repair or add capability we wanted but didn't get at initial operational capability. Today we are not correcting that trend and it has led to the frequent criticism that DoD follows a "build it now, Band-Aid it later" approach to acquisition. When we properly set the conditions for entry into production, we have achieved high confidence that we have identified and resolved the major risk areas and failure modes, and will deliver the needed warfighting capability, not just meet contract specs. DT&E is the means by which programs determine when they have properly set the conditions for entry into production, and it typically comprises more than 80 percent of the T&E activity in a program life cycle. However, more than 80 percent of our T&E resources in OSD are allocated to oversight of operational test and evaluation (OT&E).

Most in the defense T&E community know that the DT&E office in OSD all but disappeared in the not-too-distant past, and that plays strongly into why OSD test resources are so out of balance. So what happened to DT&E over the past 40 years? From the Blue Ribbon Defense Panel to today, the DoD and Congress have focused on OT&E. It is not unreasonable to conclude that with all attention on OT&E, the entire acquisition system would respond accordingly and shift focus and resources for testing to the right, to "passing IOT&E" and getting to FRP. Forty years of T&E hindsight suggests that is a fundamentally flawed strategy. As the Under

Secretary of Defense for Acquisition, Technology and Logistics (USD[AT&L]) shapes the role of the office of the Deputy Assistant Secretary of Defense for Developmental Test and Evaluation (DASD[DT&E]), history may be a valuable tool, so that in the spirit of George Santayana, the DoD won't be "condemned to repeat it."

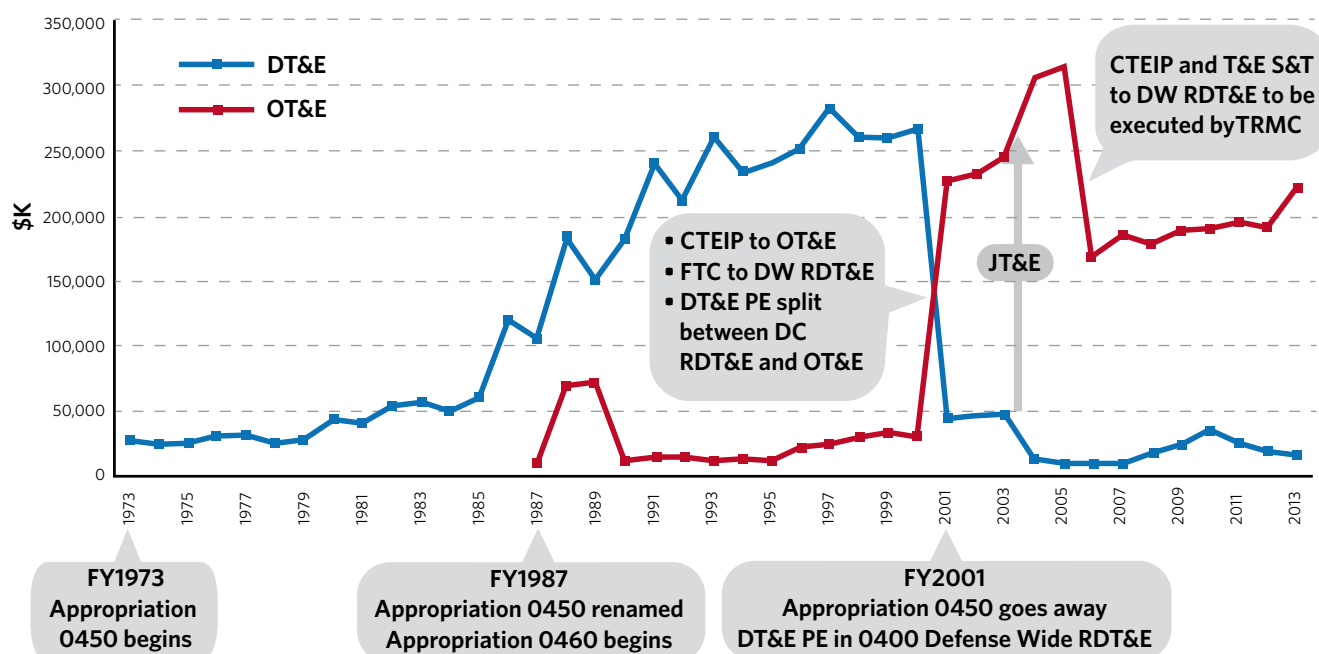
Testing is a means to obtain information to inform acquisition decisions—build or buy decisions—Milestone (MS) decisions. We need to think about how to improve DT&E to support acquisition decisions better. I provided some thoughts on how to improve and strengthen DT&E in the "Shift Left" article in the September–October 2013 issue of *Defense AT&L* magazine. For most programs, a robust DT&E strategy is essential to informing the MS C decision to enter low-rate initial production (LRIP). If we don't get it right in DT&E, design problems we didn't find and fix before beginning LRIP can become the warfighter's problems. By shifting left to improve DT&E, programs will be better able to find and fix deficiencies before beginning production, and that will lead to improved acquisition outcomes.

Follow the Money

It is often said in the Pentagon and in other areas of government that if you want to see how things get done, "follow the money." The history of the DT&E office is clearly visible in the funding line.

The DASD(DT&E) office traces its roots back to the office of the Deputy Director for Test and Evaluation (DD(T&E)) created by David Packard, although its title and location within the acquisition chain have changed many times since then.

Figure 1. Funds for OSD DT&E and OT&E



In fact, all of today's OSD test organizations have roots in the original DD(T&E) office, including the Test Resource Management Center (TRMC), the Foreign Comparative Testing (FCT) Office, and even the office of the Director, Operational Test and Evaluation (DOT&E) and its subordinate offices for live-fire and joint T&E (LFT&E, JT&E). Throughout those early years, the DD(T&E) was responsible for more than 80 percent of the OSD test resources. However, a major realignment in June 1999 transferred the majority of resources to the DOT&E and virtually eliminated the DT&E office as an effective OSD staff entity. Another 10 years would pass, and the Weapon Systems Acquisition Reform Act (WSARA), Public Law (PL) 111-23, resurrected the DT&E office.

Figure 1 depicts the dollars appropriated for the DT&E and OT&E offices from fiscal year (FY)1973 to the present. These are unadjusted, "then-year" dollars, precisely as given in the defense appropriation acts. Appropriation 0450 for the Director, Defense Test and Evaluation began in FY1973. The DOT&E position was created in 1983, but the first director was not appointed until 1985. Thus, funds were not appropriated for the DOT&E until FY1987. When the DOT&E appropriation 0460 began, appropriation 0450 was retitled for the Director, Developmental Test and Evaluation. The major shift in OSD funding corresponds to the June 1999 decision to transfer T&E functions to DOT&E, with the funds moving in the FY2001 appropriation law. Appropriation 0450 for the Director of Developmental Test and Evaluation went away completely; its programs were distributed between 0460 OT&E and 0400 Defense Wide Research, Development, Rest and Evaluation (DW RDT&E). Since there no longer is a specific appropriation for DT&E in the defense appropriation laws, the dollar amounts shown for DT&E from FY2001 to the present are as reported in the "R-1" budget exhibits (see <http://comptroller.defense.gov>). In FY2001, funds for the Central Test and Evaluation Investment Program (CTEIP) moved from DT&E to OT&E, and funds for FCT moved from DT&E into DW RDT&E.

Strangely, the DT&E program element (PE) was split between DW RDT&E and OT&E; in other words, both the DT&E office and the DOT&E were expending funds assigned to the same DT&E PE. The DT&E PE continued to be shared until FY2007, when the portion of funds allocated to DOT&E was renumbered and renamed "operational test activities and analyses." The DOT&E also managed the T&E Science and Technology (S&T) PE when it began in FY2002. The JT&E program was transferred to the DOT&E in December 2002 (the money moved in FY2004), and in FY2006 the CTEIP and T&E S&T dollars moved out of OT&E to DW RDT&E to be executed by the newly created TRMC.

On face value, Figure 1 supports the assertion that more than 80 percent of OSD test resources support OT&E oversight. However, a significant part of the OT&E appropriation includes funds for the LFT&E program and "OT activities and analyses," which now includes the JT&E program. If these are not considered, what remains are the funds for the

Table 1. FY2012 Funding for OSD DT&E and DOT&E

Program Element	\$ Millions
DT&E	
0605804D8Z Development Test and Evaluation	15.8
OT&E	
0605118OTE Operational Test and Evaluation	60.4
0605131OTE Live Fire Test and Evaluation	12.1
0605814OTE Operational Test Activities and Analyses	118.7
Total OT&E	191.2

program oversight function. The imbalance remains large. For example, as shown in Table 1, the FY2012 budget (the most recent budget unperturbed by sequestration) included \$15.8 million for DT&E program oversight and \$60.4 million for OT&E; hence, only 20 percent of the total \$76.2 million funds DT&E program oversight.

How this resource imbalance came about is an interesting story.

A Brief History of DT&E

The Original DD(T&E)

Deputy Secretary of Defense David Packard created the office of the DD(T&E) in response to recommendations of the Blue Ribbon Defense Panel (BRDP) in July 1970 (see <http://www.dtic.mil/dtic/tr/fulltext/u2/a013261.pdf> for the BRDP report). The BRDP was essentially concerned about operational test and independence. As described in the January-February 2014 issue of *Defense AT&L* magazine, Packard tackled the BRDP concerns head on. Packard issued three memoranda in the first eight months of 1971 that made sweeping changes to the role of T&E, including directing the Services to restructure their OT&E organizations to be "separate and distinct from the developing command" and establishing the DD(T&E) within the Office of the Director of Defense Research and Engineering (ODDR&E) with "across-the-board responsibilities for OSD in test and evaluation matters." The ODDR&E was responsible for major acquisitions at that time, thus it preceded both the Assistant Secretary of Defense for Research and Engineering that we know today, as well as the USD(AT&L). However, operational test and independence would come to dominate the T&E landscape.

OT&E and Independence

Many in DoD had observed that since the Director of Defense Research and Engineering was the department's chief acquisition official, assignment of the DD(T&E) under this official posed a conflict of interest, and violated the BRDP admonition that when responsibilities for evaluation are subordinated to the developer, "the requisite objectivity is

seriously jeopardized." October 1977 saw a minor power struggle over where responsibilities for OT&E should be assigned to satisfy the BRDP concerns, and it resulted in responsibilities for OT&E being reassigned to the ASD(Program Analysis and Evaluation). How to divide the people and dollars proved to be an intractable problem, so in a memo dated Nov. 17, 1978, "Operational Test and Evaluation," Deputy Secretary Charles W. Duncan, Jr. transferred responsibility for OT&E back to the USD(R&E), writing, "The Director, Defense Test and Evaluation is the cognizant executive for all Test and Evaluation matters."

The issue wasn't settled though, and Congress made the next move. In May 1982, Arkansas Sen. David Pryor introduced legislation to create a director of OT&E. It was not well received in the Pentagon. The debate about OT&E and independence consumed over a year, and on Sept. 24, 1983,

also stipulated that the DD(T&E) would be redesignated as Director of Developmental Test and Evaluation.

The Pentagon Wars

In the early 1980s, testing defense systems became the center of attention in a very public way in the form of the well-known "Pentagon Wars" (although the book did not come out until 1993, and the movie in 1998). Live-fire T&E was the central issue, and in November 1986, the DT&E director created a new office to oversee live-fire testing, but Congress moved LFT&E oversight to the DOT&E in October 1994 (PL 103-355 §3012).

On Nov. 1, 1994, the title of the DT&E office changed to Director, Test, Systems Engineering and Evaluation (DTSE&E). However, the pivotal reshaping of DT&E (and DOT&E) took place in June 1999, prompted by a pair of "streamlining

By shifting left to improve DT&E, programs will be better able to find and fix deficiencies before beginning production, and that will lead to improved acquisition outcomes.

in PL 98-94, Congress established the position DOT&E, presidentially appointed, Senate confirmed, independent of the acquisition authority and reporting directly to the Secretary of Defense.

The DoD acted quickly to create the DOT&E office, although it would be 20 months before the DOT&E job would be filled. On Nov. 28, 1983, DASD (Administration), David O. "Doc" Cooke, working with Richard DeLauer, USD(R&E), wrote a memorandum to the Secretary of Defense, titled "Establishment of the Director of Operational Test and Evaluation—ACTION MEMORANDUM." Cooke and DeLauer had carefully thought through the functions to be performed by the DD(T&E) and the DOT&E, and described them this way:

We propose to adopt a definition of OT&E which clearly distinguishes it from all other test and evaluation activities in the development and acquisition cycle. We recommend that OT&E apply to field tests conducted with production articles which are fully representative of the intended operational configuration of new weapons. All tests before that time, whether laboratory or field, would be considered DT&E and part of the weapon development process.

Cooke noted that this definition was consistent with congressional guidance for ensuring the adequacy of OT&E before proceeding "beyond low-rate initial production." The memo

memos" to the Secretary and Deputy Secretary from Jacques S. Gansler, USD(Acquisition & Technology), and Philip E. Coyle, DOT&E, in May 1999. In the "Plan to Streamline Test and Evaluation—INFORMATION MEMORANDUM," Gansler and Coyle wrote:

As you know, the Under Secretary of Defense for Acquisition and Technology (USD[A&T]) has advocated for many years that serious testing with a view toward operations should be started early in the life of a program. Early testing against operational requirements will provide earlier indications of military usefulness. It is also much less expensive to correct flaws in system design, both hardware and software, when caught early. ... Consistent with this, the USD(A&T) has decided to disestablish the office of the Director, Test, Systems Engineering and Evaluation (D,TSE&E) within USD(A&T), with the recommendation to strengthen the role of the Director, Operational Test and Evaluation (DOT&E).

Other changes included transferring oversight of the major range and test facility base to DOT&E, and realigning what remained of DT&E oversight and the JT&E program under the USD(A&T) Director for Strategic and Tactical Systems (S&TS). On June 7, 1999, 28 years to the day after Packard appointed the first DD(T&E), Secretary of Defense William Cohen approved the transfer, and Gansler went on to disestablish DTSE&E, and moved DT&E under S&TS.

Gansler and Coyle's approach is especially noteworthy for two reasons: first for identifying the need to improve testing—the authors used the phrase “serious testing”—early in the life cycle and second for concluding that the means to improve early testing was to strengthen the OSD office that oversees OT&E. The opportunity to shift focus toward “serious” developmental testing slipped through their grasp, and it ushered in a decade of declining interest in OSD DT&E oversight in particular, and program DT&E in general.

The erosion of DT&E responsibilities continued, and on Dec. 9, 2002, the USD(AT&L) transferred the JT&E program to the DOT&E. What remained of the DT&E organization moved again, this time placed under the director, Systems and Software Engineering. Finally, on May 22, 2009, the WSARA, PL 111-23 Section 102, reversed the decline and re-established the DT&E office. Now in the post-WSARA era, we have an opportunity to change course, to shift focus to DT&E and readiness for production; we must not let it slip through our grasp.

Conclusion

To the question posed in the title of this article—“What Happened to DT&E?”—I submit that the circumstances that decades ago prompted creation of the Operational Test Agencies and DOT&E caused us to take our eyes off the target. The breadth of DT&E was understood by Cooke and DeLauer when they proposed that “OT&E apply to field tests conducted

with production articles which are fully representative of the intended operational configuration of new weapons. All tests before that time, whether laboratory or field, would be considered DT&E and part of the weapon development process.” However, instead of building and resourcing an organization to oversee the magnitude of developmental testing that statement describes, the department put its priorities on OT&E. In the post-WSARA era, each major defense acquisition program is to have a chief developmental tester and a government organization serve as lead DT&E organization. The chief developmental tester and lead DT&E organization must assume responsibility for planning and conducting robust DT&E in a mission context—or using words from the past, “serious testing with a view toward operations early in the life of a program”—to identify risks, correct deficiencies, and set the conditions for entry into production. Developmental test and evaluation is the key to improving acquisition outcomes.

Note: The author would like to thank the following for contributing to the history project: Jack Krings, Pete Adolph, Tom Christie, Joe Navarro, Steve Kimmel, Irv Boyles, Charlie Ackerman, John Bolino, Pat Sanders, Charles Watt, Jim O'Bryon, Rick Lockhart, Chris DiPetto, Rich Stuckey, Parker Horner, the OSD Historian's Office, and the OSD Correspondence Office. I apologize to anyone I have inadvertently left off this list. Finally, I want to offer special thanks to Stephanie Lindemann in ODASD(DT&E) for her outstanding research and assistance.

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Let's Fix this **Red** Program!

Brian Schultz

For those not familiar with Norman Augustine's laws, they are a collection of 52 observations first published in 1983 by Augustine, former president and chief operating officer of Martin Marietta Corp. While the laws are humorous, they also offer interesting insights into the tough realities of defense acquisition.

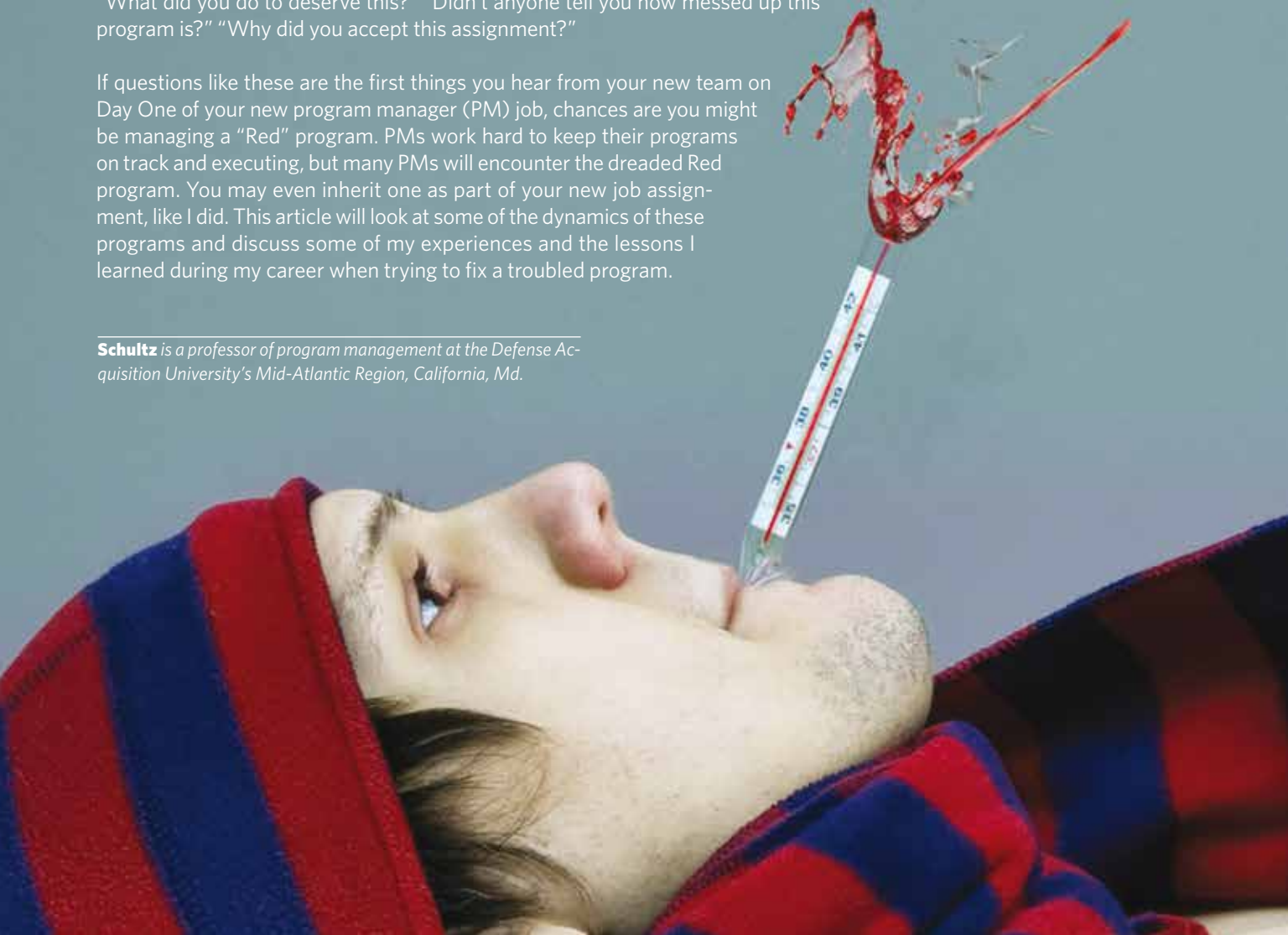
"Although most products will soon be too costly to purchase, there will be a thriving market in the sale of books on how to fix them."

—Norman Augustine's 19th law

"What did you do to deserve this?" "Didn't anyone tell you how messed up this program is?" "Why did you accept this assignment?"

If questions like these are the first things you hear from your new team on Day One of your new program manager (PM) job, chances are you might be managing a "Red" program. PMs work hard to keep their programs on track and executing, but many PMs will encounter the dreaded Red program. You may even inherit one as part of your new job assignment, like I did. This article will look at some of the dynamics of these programs and discuss some of my experiences and the lessons I learned during my career when trying to fix a troubled program.

Schultz is a professor of program management at the Defense Acquisition University's Mid-Atlantic Region, California, Md.



Background

What exactly is a Red program? According to the Defense Acquisition Executive Summary (DAES) Charts Standards definitions, a Red program is defined as follows:

Some aspects of the program (contracts, approved Acquisition Program Baseline) are not met for performance, schedule, cost and funding requirements. There is insufficient trade space to close the issues or mitigate risk. The program may require restructuring and/or additional funding. Any Red indicator will require a closure plan within 30/60/90 days to return to Green.

As the definition highlights, a Red program is one that is not executable without help. It either needs additional funding, time, relief from performance requirements or a combination of changes to these program thresholds.

"If a sufficient number of management layers are superimposed on each other, it can be assured that disaster is not left to chance."


—Norman Augustine's 26th law

While each program has its own set of unique circumstances, unhealthy programs often have some common threads. We can learn valuable lessons from examining these programs, including the specific root causes of the problems. Some Red Major Defense Acquisition Programs (MDAPs) have incurred a significant and/or critical Nunn-McCurdy cost breach.

As part of the Weapon System Acquisition Reform Act of 2009, these critical cost growth breaches now trigger a review by the Performance Assessments and Root Cause Analyses (PARCA) Office in Under Secretary of Defense for Acquisition, Technology, and Logistics (USD[AT&L]). A summary of PARCA's findings and other relevant acquisition performance information is addressed in the June 28, 2013, "Performance of the Defense Acquisition System, 2013 Annual Report" (<http://www.defense.gov/pubs/PerformanceoftheDefenseAcquisitionSystem-2013AnnualReport.pdf>). In reviewing PARCA's root cause assessments of these breach programs, two common areas stand out in nearly all the reports: unrealistic estimates (cost, schedule, and performance) and poor management performance.

The analysis suggests that overly optimistic program estimates often are driven by unrealistic assumptions at the inception of a program. These assumptions then are carried forward into the estimating and program structure that lays the foundation for execution. Note that cost- and schedule-estimating models were not identified as the problem. The estimating methods and models are only as good as the input data and assumptions that drive the outputs.

One lesson learned highlights the importance of a rigorous program start-up, planning and estimating effort and suggests that a program's basic planning assumptions should be updated and tested periodically as the program evolves.



Overly optimistic assumptions can affect all acquisition category programs, including very small ones. One lesson learned highlights the importance of a rigorous program start-up, planning and estimating effort and suggests that a program's basic planning assumptions should be updated and tested periodically as the program evolves. This is consistent with language in the "Director, Cost Assessment and Program Evaluation (CAPE) FY 2012 Annual Report on Cost Assessment Activities."

The CAPE report highlights how CAPE satisfies the confidence-level statutory requirement used in establishing a cost estimate of an MDAP or a Major Automated Information System program by ensuring that all its cost estimates are built on a product-oriented Work Breakdown Structure, based on historical, actual cost data whenever possible and, most importantly, based on conservative assumptions consistent with demonstrated performance for a series of successful programs.

Poor management performance is associated with program execution and is broken down further into systems engineering, contractual incentives, risk management and situational awareness issues. While the lessons learned vary for each program, the report highlights the importance of effective program management in keeping a program on track.

My Experiences and Lessons

"The last 10 percent of performance generates one-third of the cost and two-thirds of the problems."

—Norman Augustine's 15th law

Many of us may have heard that the 80 percent solution is good enough. PMs working to recover a Red program may find that a rebaselining of their program presents an opportunity to revisit some of the technical requirements that are not fully met and difficult to achieve. The requirements community recently addressed this subject in a Vice Chairman of the Joint Chiefs of Staff Memorandum, "Key Performance Parameter [KPP] Relief," Jan. 23, 2013 (<https://acc.dau.mil/CommunityBrowser.aspx?id=633908>). The memorandum states that "KPP relief should be considered especially appropriate in cases where significant cost savings may be achieved with marginal impact to operational capability (i.e., spending 15 percent of a program's budget to get the last 3 percent of KPP performance)."

A few years ago, I inherited a major weapon system upgrade program that was restructured after significant technical issues, delays and cost overruns. This program was rebaselined with new cost, schedule and technical thresholds. A new joint contractor and government team was brought in and was determined to deliver this product. The upgrade included a new airborne mission computing system that was software intensive and very complex due to the required integration of multiple sensors and communications systems.

Despite significant doubts from key stakeholders, the development of the restructured program was tracking very close to the new program baseline. We were concerned about how the system would perform in full-up system-level developmental and operational testing. The size of the software program was much larger than originally planned, and we could not afford to re-engineer the supporting hardware architecture given our budget and schedule constraints.

Our team knew going in that the mission computing architecture was an issue because it often crashed or locked up if it was stressed too heavily during test missions. It was stressed similar to a personal computer when a user opens many menus and applications simultaneously. If the system's memory and throughput can't support the demand, the system will lock up or crash and then must be rebooted. Obviously, an unstable system is unacceptable for the user and casts doubt on its reliability to complete the assigned missions.

Given that a new mission computing architecture would take significant time and funding to re-engineer and test, we explored potential work-arounds that would improve system stability. The simplest work-around was to limit the applications the system concurrently ran. While this was

not optimal, it did solve the immediate problem within our limited budget and also enabled users to complete their mission. We worked hard with the test and user communities to manage their expectations with this limitation. After careful deliberations, they agreed to accept the operational work-arounds but only after operational testing demonstrated the system was workable.

Knowing we had laid out a credible plan to upgrade the system helped obtain the user and test communities' buy-in to move forward. We also would receive the benefit of operational deployment feedback that could be incorporated in the next increment. Our 80 percent solution kept the program moving forward and delivered a significant operational capability. I firmly believe that if we had tried to resolve everything in the first increment, we would have breached our budget and schedule again and faced a potential program termination.

"Fools rush in where incumbents fear to tread."

—Norman Augustine's 33rd law

PMs managing a Red program also may face team morale, trust and relationship challenges. The stress of working on a troubled program can result in behavior changes that are detrimental to a good working relationship. Failure of the joint Defense Department and contractor team to work together effectively can render success difficult.

The following are some additional actions I have observed that can help teams get their programs back on track. One of the first items to consider is a replacement of key personnel, including the PM for both the Defense Department and contractor teams. This enables a fresh look at the issues and can help recharge the teams' energies. Obviously, the transition should not be an assignment of blame but rather an opportunity to transition to new leadership with new ideas. Bringing in new, emotionally unencumbered functional experts also may prove helpful.

The new program leadership will want to assess the organizational climate and may conduct anonymous surveys to gauge how the team assesses the program. It's important for the PMs to share the survey results with the team and to secure buy-in on actions that address the predominant issues. Empowering the team to develop action plans is a good way to get them to buy in, since they will have come up with the ideas.

A plan to follow up and track the specific actions will send the message that this effort is important. Likewise, the lack of follow-up suggests that the issues identified are not a priority and that the event was a poor use of valuable time and resources. Issues such as communications, trust and clear processes often are identified for action. These issues

often can be attributed to the overall culture of the program office teams.

Changing the culture of the organization may be necessary. This can be a difficult path to pursue, especially with staff members who may have been entrenched for a long time and resist change. Based on my experience, this kind of change will take time, and leaders should not expect significant changes overnight. Numerous models and training courses can be leveraged to help effect organizational and strategic changes. PMs should consider expert assistance before attempting this kind of effort.

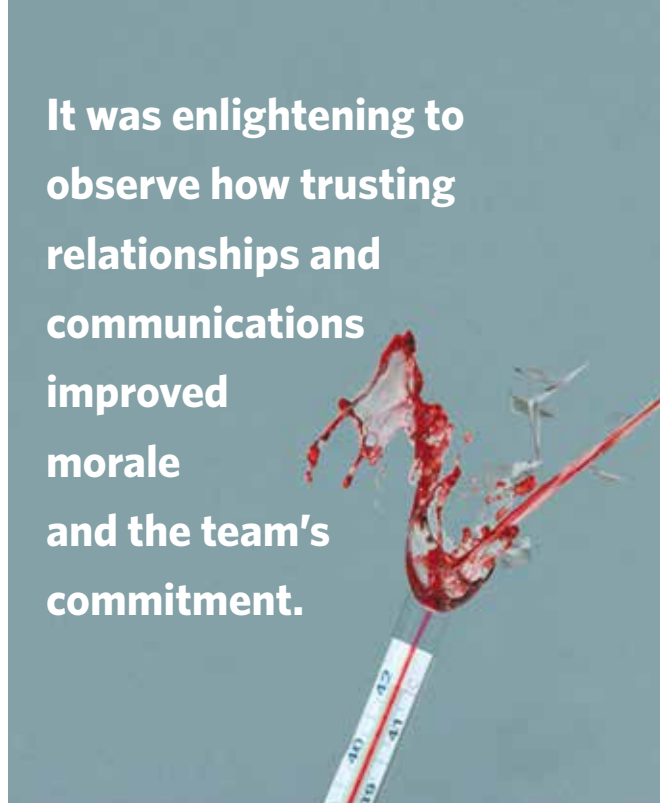
Years ago as a more junior PM, I observed a senior program office PM as he dealt with significant technical challenges on a Red program. This individual had excellent business and technical skills but was under significant stress due to the program issues. He had strong ideas on what needed to occur to correct the issues but was not receptive to feedback and collaboration from his staff. Needless to say, the team's morale and communications suffered while the program issues remained unresolved.

The new PM who took over was concerned not only with the program issues but with the team's welfare. He took the time to establish good working relationships with the contractor and the government team. It was enlightening to observe how trusting relationships and communications improved morale and the team's commitment. One of the changes the PM implemented was to create a culture of credibility. This meant we were careful about what we signed up for, but when we did sign up we would make sure we delivered as promised. Executing and meeting our targets started a cycle in which success bred more success. It also was very satisfying to know we turned the program around and eventually delivered the system to the warfighter, despite significant doubts about whether it would ever happen.

Since Red programs are stressful and often tough work environments, it can be difficult to fill vacancies and retain staff. Word spreads fast about "sinking ships!" Similar to the success spiral, bad results lead to more bad outcomes and this can be a tough cycle to break. Ensuring that the team has the needed resources and expertise is a great start to getting back on track. While vacancies are common, PMs must give priority to continually assessing their personnel and work to resolve lingering shortfalls.

I once observed a program office team that was so accustomed to personnel shortages that they would plan and structure programs around reduced manpower. As a result they did not plan for or perform important tasks, took shortcuts, and assumed greater risks. This approach may be well-intentioned, but it is not a good recipe for success. An alternative to working an understaffed program is to turn away new work. This is exactly what one agency I worked for did for a short period when reviewing new work that was beyond what the agency could reasonably support.

It was enlightening to observe how trusting relationships and communications improved morale and the team's commitment.




Obviously, not all Red programs will recover. And some programs, including healthy ones, will be terminated or restructured into different efforts. DAU and Service experts have addressed smart shutdown of programs with a Special Interest Area (<https://acc.dau.mil/smartshutdown>) within the Acquisition Community Connection portal. Also available are a guidebook, best practices and other useful information.

Final Thoughts

"Ninety percent of the time things will turn out worse than you expect. The other 10 percent of the time you had no right to expect so much."

—Norman Augustine's 37th law

The stress of working on a healthy acquisition program can be significant, and it only gets worse with a Red program. PMs and their teams working on a Red program should navigate very carefully through their get-well plans. Recovery to an executable program that delivers acceptable operational capability to the user may require some significant changes in the program structure, requirements, staffing and even organizational culture.

The get-well journey will often be difficult but can also be very rewarding. Hard work, commitment and teamwork with the contractor will be great attributes to overcome the challenges. The sense of pride and accomplishment in recovering a Red program and delivering capability to the warfighter will make it all worthwhile! 

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Threat Support Improvement

for DoD Acquisition Programs

Christopher Boggs ■ Maj. Jonathan Gilbert, USAF
Paul Reinhart ■ Maj. Dustin Thomas, USAF
Brian Vanyo

Department of Defense Instruction (DoDI) 5000.02 requires the intelligence community to provide a technology-based assessment, known as the System Threat Assessment Report (STAR), delivered at Milestones B and C. The STAR is intended to reduce technology surprise for weapon systems in development by informing the program office of foreign developments and operational capabilities.

Changes to DoDI 5000.02 are expected to force a dramatic increase in STAR production, due to new requirements for an additional STAR at Milestone A and for system-specific STARs for all Major Defense Acquisition Programs, Major Automated Information System programs, and programs under oversight of the Director of Operational Test and Evaluation in the Office of the Secretary of Defense. The DoD intelligence community must adapt to meet the increased demand for STAR production, but without additional resources.

Boggs is a former Army Signal Corps Officer. Currently with the Defense Intelligence Agency (DIA), he supports Major Defense Acquisition Programs and Major Automated Information Systems with adversary Cyberspace Operations and Information Operations threat assessments.

Gilbert is an Air Force acquisition officer with previous assignments in intelligence, test, and research labs. He currently provides DIA intelligence support to Department of Defense (DoD) acquisition programs. **Reinhart** is a former naval aviator and is now a DIA aviation-related technology specialist, supporting Major Defense Acquisition Programs with analysis and oversight of related assessments. **Thomas**, an Air Force engineer with previous assignments in operational test and research labs, currently provides intelligence support to DoD acquisition programs. **Vanyo** is a former naval flight officer and now is an aviation-related DIA technology specialist, supporting Major Defense Acquisition Programs with analysis and oversight of related assessments.



Modifications to current threat-support production methodology will create an efficient means to enable both large-scale STAR production and to standardize content for all STARs, ensuring currency of the information, uniformity of assessments and improved decisional value for the requirements generation, acquisition and test communities.

Today's System Threat Assessment Report

Today's STAR is a labor-intensive document to produce, often with outdated content and sometimes offering limited decisional value to program managers, the test community and the milestone decision authority. Most of these inherent issues with STAR production and content are not evident to DoD customers who may be using these assessments to inform program decisions.

Most STARs are produced by a relatively small number of authors at Service intelligence units. Complicating production is the lack of uniformity in how the Services implement their STAR programs. In some cases the Services decentralize production to the local systems

command intelligence support units; others produce it at the Service intelligence centers without much interaction with the systems command intelligence support units. STARs are also reviewed or "validated" by different organizations, based on the program acquisition category (ACAT) level. Respective Service intelligence directorates validate threat documentation for ACAT IC programs and below.

The Defense Intelligence Agency's Defense Technology and Long-Range Analysis Office (DIA/TLA) is the validation authority for ACAT ID and ACAT IAM program threat assessments. Over the last 6 years, TLA has noticed a number of production process inefficiencies and content standardization issues in most intelligence assessments supporting DoD acquisition programs.

Delivery Schedule: Current STARs are not produced in time to influence design decisions. They offer inconsistent decisional value, and they are not tailored to support key activities in the acquisition process. DoDI 5000.02 currently requires a program STAR at


Milestones B and C, but these events occur after the validation by the Joint Capabilities Integration Development System (JCIDS)/Joint Requirements Oversight Council of threat-sensitive Key Performance Parameters (KPPs) or Key System Attributes (KSAs), and take place after most system design decisions.

Topic Redundancies: Topic redundancies are costing thousands of work hours across the intelligence community through inefficient and labor-intensive production processes,

key trends by using a source that does not happen to capture current thinking of relevant subject matter experts in the intelligence community.

Improving the Value of Threat Assessments for OSD

We believe we can improve the value of threat support provided for acquisition programs and can correct many current deficiencies noted above through two key steps: development of an authoritative, DIA-validated, DoD threat library



Certain topics appear in multiple STARs, and therefore are being reviewed dozens of times per year by the DIA, the test community, systems commands and the Service intelligence centers.

with little value added for the additional reviews. Certain topics appear in multiple STARs, and therefore are being reviewed dozens of times per year by the DIA, the test community, systems commands and the Service intelligence centers. For example, “Ground-Based Early Warning Radar Threats” is a topic in the 2012 or 2013 editions of STARs for the F-22, F-35, Global Hawk, KC-46A, B61 Tail Kit Assembly, Naval Rotary Wing Aircraft and Naval Fixed Wing Aircraft. Each of these documents required a separate review and update process by the handful of ground-based radar experts at a cost of lost analysis and production, which could have contributed to other important work, such as threat modeling.

Ineffective Reviews: The current review process sometimes is ineffective in catching new threat developments, possibly due to the large size of current STARs and the large number of redundant reviews by the same analyst in a given year. Reviewing personnel tend to be less thorough when asked to review the same products, or very similar products, several times. The effect becomes apparent when major threat developments are not reflected in a STAR despite numerous reviews.

Authoritative Sources: STAR authors today have no single authoritative source for a DoD position on any given technology topic; hence the same “Ground-Based Early Warning Radar Threats” topic often is covered in multiple Capstone Threat Assessments and STARs. Consequently, two different programs may receive substantially different assessments on the same topic, with both assessments considered equally valid during a given 2-year period. STAR authors lacking a particular subject matter expertise might inadvertently miss

of technology-related threat assessment modules; and basing STAR production around life-cycle/design-related events instead of milestones.

DoD Threat Library: Today’s Capstone Threat Assessments are used as de facto sources for most STAR content, but with all the standardization issues detailed above. Replacement of the Capstone volumes with a centrally managed DoD library of technology topic assessments would provide customers and STAR authors with an identifiable, current and authoritative source for each topic relevant to acquisition programs.

Key advantages of a centrally controlled DoD threat library:

- Centralized threat content ensures a single, identifiable source is provided for the intelligence community and all OSD/Service customers on a given topic, which eliminates the potential for contradictory information presented to decision makers on the same topic.
- A central DoD threat library should enable faster production of threat assessments, by maintaining a set of reference assessments in a validated state.
- Central control of all STAR topics provides a means to identify infrequently updated assessments and to regularly update all technology topics relevant for programs.
- An online threat library, based on the Secret Internet Protocol Router Network, would provide the required data for future searchable tools, useful to generate a set of relevant threats for considering planned capabilities or for developing program requirements (e.g., providing the requirements

community with a tool for considering threats during requirements development efforts).

The Service intelligence centers and related STAR producers also would benefit from efficiencies gained through eliminating redundant production of the same assessment topics in multiple, simultaneous, yet separately produced, assessments.

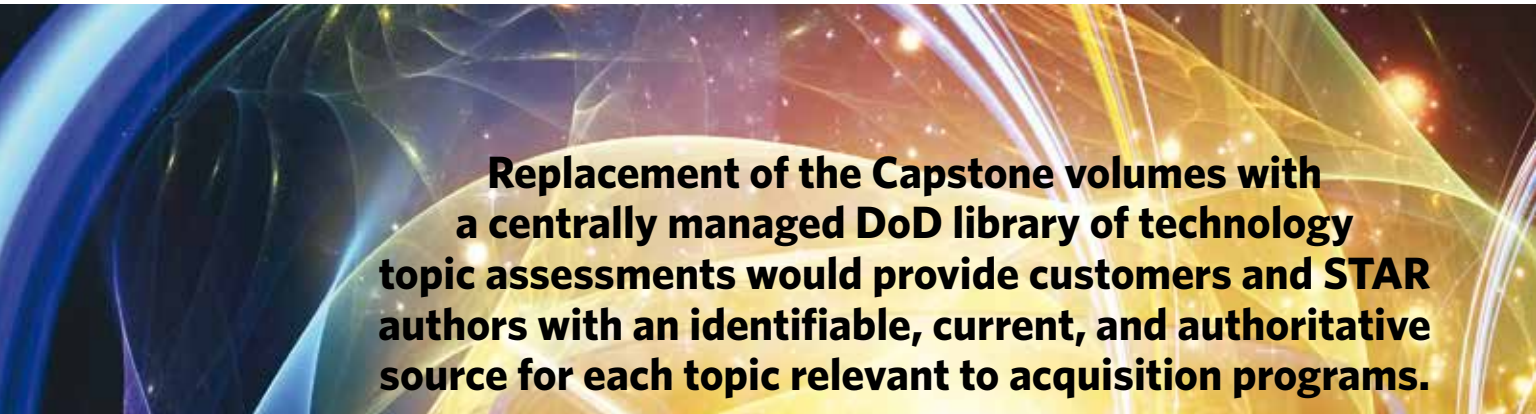
There are several reasons to standardize the content of all threat assessments provided to the acquisitions community, regardless of whether this is accomplished within a centrally controlled DoD threat library.

- Today's threat assessments often exceed 400 pages, and the varying level of detail across each topic often buries key points in unnecessary detail.
- The decisional value of threat assessments to the acquisition, requirements and test communities should be significantly improved. Assessments should state all threats in terms of "most likely" or "most stressing," which should clearly draw a line for program officials deliberating on performance thresholds (minimum acceptable capability) versus performance objectives (desired capability). All "most stressing" example systems should also include the estimated inventory of those systems.

Program Event-Based Threat Assessment Production: We propose four threat assessments that will be delivered during a program's life cycle, each carefully tailored for specific customer sets performing specific functions during a program timeline.

planned program capabilities listed in the Initial Capability Document (ICD). ITEAs will include relevant threat key judgments to drive potential material solutions and inform the development of threat sensitive KPPs and KSAs.

- **Milestone A STAR (MS A STAR):** Delivered at Milestone A, at roughly 20 to 50 pages long. The primary MS A STAR customer is the capability developer, and the STAR would inform the "downward V" of the technology development phase as depicted on the Integrated Defense Acquisition, Technology, and Logistics Life Cycle Management System diagram (a.k.a., the "horse blanket"). This STAR will build on the ITEA and add detail by drawing on information from the AoA report, such as the identification of enabling and critical technologies, as well as great specificity in likely program attributes. The Milestone A STAR also will contain critical intelligence parameters (CIPs) used to shape the tradespace identified in KPPs and KSAs.
- **System Requirements Review STAR (SRR STAR):** Delivered by the system requirements review, at fewer than 200 pages. The SRR STAR main customers are the program manager, preliminary design review team, and the test community. The SRR STAR would build upon the Milestone A STAR, and will become more system specific by using information from the draft Capability Development Document (CDD), including the DoD architectural framework views (i.e., OV-1, SV-6), KPPs, and KSAs. Projected enemy force numbers drawn from intelligence community projections will be included to highlight "most likely" threats.
- **Test Readiness Review STAR (TRR STAR):** Delivered 90 days before the TRR, and shorter than 200 pages. The TRR STAR main customers are the program manager, full-rate



Replacement of the Capstone volumes with a centrally managed DoD library of technology topic assessments would provide customers and STAR authors with an identifiable, current, and authoritative source for each topic relevant to acquisition programs.

- **Initial Threat Assessment Report (ITEA):** Delivered 30 days into the analysis of alternatives (AoA), and roughly 20 pages long. The ITEA would be written for the systems commands and capability developers, and it would be used to inform the AoA decision, leveraging the DoD threat library and its DoD-validated key judgments. The advantage of the ITEA is to reduce the possibility of a program told one thing during requirements generation, then held to a different intelligence community judgment during later operational testing. ITEAs should focus on threats to

production decision team and the test community. This will build on the SRR STAR and will be more tailored to the program by including a complete system description. This STAR will inform the full-rate production decision and TRR.

A Streamlined Production Process for Threat Assessments

The DoD has assigned specific responsibility (and topic authority) to the Service intelligence centers and DIA for most technology assessment topics. Threat assessments would

heavily leverage a DoD threat library as a primary source for threat information, with references to additional databases and sources of further detail.

- DIA or another appropriate DoD-level organization would task the Defense Intelligence Enterprise for production of all DoD library topics, annually or biennially. All DoD threat library topics would be directly produced by the topic-responsible Service intelligence center, which would eliminate the risk that relevant subject matter experts might be skipped during STAR production and thereby miss the chance to make urgent changes for a given STAR topic.
- All DoD threat library content would be reviewed by the entire DoD intelligence community per current practice for Capstone Threat Assessments and STARs, but each topic would only be reviewed once by relevant subject matter experts every 1 or 2 years. Subjects requiring interim updates could be easily produced due to the small size of each topic assessment, with update notification sent to all regular STAR producers.
- Program STAR production would start with a review of all DoD threat library topics to identify topics relevant to the program and any new topics that should be produced.
- STAR authors would assemble all relevant topics from the DoD threat library, and would introduce each topic with a “relevance to program” statement, with assistance from the supporting systems command intelligence organization.
- Program offices would continue to provide system descriptions and acquisition documents (ICD, CDD, etc.).
- Systems command intelligence organizations would continue to develop critical intelligence parameters for the JCIDS sponsor and program office, with assistance from the Service intelligence center and DIA.

- DIA validation would consist of verification that the current set of DoD threat library assessments has been reflected in the STAR. Any late-breaking Service center assessments that would alter DoD analytic judgments would be included, which would also drive interim updates to the DoD threat library.
- ACAT ID STAR coordination will be reduced to the primary stakeholders, including the applicable Service intelligence centers, DIA, and the program office, thereby greatly reducing the number of work hours community wide. ACAT IC programs (and below) could use the same production process without DIA involvement to further standardize threat-assessment production.
- JCIDS sponsors or program offices retain their ability to request interim STAR updates, and program managers would retain the local intelligence support office for additional threat information.

We believe this proposal will dramatically improve the value of STAR content to the DoD customer set while enhancing both efficiency and responsiveness of the intelligence community in support of defense acquisition programs in general. We also believe this concept probably is the only conceivable means for the intelligence community to meet the increased demand for acquisition-related intelligence in an age of decreased resources. &

The views expressed in this paper are those of the authors and do not reflect official policy or positions of the Defense Intelligence Agency, the Department of Defense or the U.S. government.

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Cyber Acquisition Professionals Need Expertise

(But They Don't Necessarily Need to Be Experts)

Michael Cook

Cyber acquisition professionals need to develop a wide range of expertise, not strive to become experts at any one discipline. The concept of subject matter experts (SME) that permeates the government information technology (IT) profession today must shift to nurture the concept of encouraging the workforce members to diversify their experience. It is more important than ever to develop diverse expertise through a rapid paradigm shift in thinking.

I realize this way of thinking certainly will alienate some IT professionals, many of whom take great pride in their respective specialties. I also realize that they have spent an enormous amount of time in learning their craft. However, it is a paradigm shift that I believe is needed to secure better the cyber systems and capabilities that acquisition professionals field for the Department of Defense (DoD).


Cook works at the 412th Range Squadron at Edwards Air Force Base. He is Project Management Professional certified with a master's degree from the University of Management and Technology.

The reason I say develop expertise versus becoming experts is that the technology we rely on is advancing so quickly that it is nearly impossible to become an expert at any one aspect. Take networking for instance. The cyber systems hardware, protocols and vulnerabilities known today will be obsolete tomorrow. As a result, striving to become an expert in any one IT discipline might render one less effective compared with those who focus on gaining expertise in a wide range of disciplines.

This is not to say IT professionals should not seek to develop the traditional skills that have become the foundation of the profession. Learning the knowledge and developing the skills needed to be system administrators, network administrators

The Defense Acquisition University (DAU) has superbly developed the programs that for years have trained acquisition professionals. Unfortunately, there are government employees in IT positions involved with cyber acquisitions that are not members of the Defense Acquisition Workforce and who lack the benefit of DAU training.

It is important to identify and transition individuals to the Defense Acquisition Workforce, where they can benefit from the DAU training opportunities in IT and program management. The expansion of the acquisition workforce is especially important for IT specialists, in order to better protect the systems we field for the warfighter. These training opportunities are



Striving to become an expert in any one IT discipline might render one less effective compared with those who focus on gaining expertise in a wide range of disciplines.

and field technicians are essential to IT professionals. However, it also is important to expand outside of these areas, to diversify experience in order to keep up with the profession's development as technology advances and cyber systems become more robust and integrated via convergence and interoperability.

The paradigm shift toward general expertise versus SMEs is especially important for IT professionals selected to plan and develop information assurance (IA) for the cyber systems fielded to meet our warfighters' requirements. An important aspect of fielding defense cyber capabilities is to design and implement the technology's IA when the requirement emerges and throughout the system's acquisition life cycle. IA professionals must possess wide expertise to perform this critical task. Unfortunately, due to staffing and professional development shortfalls, there is a dearth of talent to perform the necessary diligence on the myriad cyber acquisitions that our warfighters require.

So, how can we develop the experienced information assurance professionals with the breadth of expertise needed to do the job effectively? We must identify the expertise needed and how we provide it in a cost-effective manner in an austere budgetary environment. I believe the acquisition community is realizing that our IT professionals need knowledge and experience not only about the traditional IT foundations of networking, systems administration and programming, but about defense acquisition, project management, program management and cyber security.

The Defense Acquisition Workforce Improvement Act (DAWIA) has been a great asset for acquisition professionals.

developed and funded for the acquisition professionals and must be leveraged to the fullest to ensure that the professional growth and development of cyber IA professionals is attained, as well as to get the greatest return on the taxpayers' investment in DAU.

A second area that acquisition professionals supporting IA requirements need to develop is cyber security. What the DoD has determined over time is that cyber is everywhere and often is overlooked. In today's acquisition environment, supervisory control and data acquisition systems, embedded software and firmware are a few examples of what is becoming associated with cyber. As a result the threat has moved from the traditional focus on hardware and software we acquired in the past. The sphere of what must be protected to secure our technology and field capabilities for the warfighter is much greater, and requires greater diligence and expertise.

An excellent avenue open for acquisition professionals to acquire the essential knowledge is through the Cyberspace Professional Development Program (CPDP). Under this program, Air Force cyberspace professionals get professional development through classes offered at the Air Force Institute of Technology (AFIT). Specifically, the Cyber 200 and Cyber 300 courses are available to the Air Force enlisted ranks, junior officers and Air Force civilian employees serving in the Core Cyberspace Occupational Series of 301, 335, 343, 391, 801, 854, 855, 856, 1550, and 2210. In addition, classes are available to members of other Services. Having completed the Cyber 200 course, I can testify that the experience develops the knowledge and skills of cyber security professionals.

I believe project management is a third area of expertise that must be developed by the acquisition professionals who field cyber systems. Learning and understanding project management methodology is important to the development of cyber professionals and the acquisition workforce because it encourages the most efficient method for project planning, management and completion. Formal project management education also builds the foundation that acquisition program managers need to field a system. It provides the IT specialists who support the IA requirements of a cyber acquisition a way to develop techniques to identify, plan, implement and manage the IA safeguards required for cyber systems.

A number of options can be exercised to gain the project management knowledge needed by acquisition professionals. The Computing Technology Industry Association (CompTIA) offers an excellent avenue to acquire the basic project management knowledge through the CompTia Project+ certification. For those professionals considering project management as a career, the Project Management Institute offers the very challenging Project Management Professional program. DAU also offers courses that focus on developing project managers.


Developing expertise across disciplines has become essential for other reasons. We find that technology grows faster than we can implement it in the systems we field. The rate of expansion has far exceeded our government's ability to field systems quickly as well as industry's ability to design, engineer and build them. This comes at a time when we are continually told to "do more with less" in budgets and personnel.

Simply put, the expectation has quickly arisen that IT specialists and acquisition professionals grow and develop to take on more responsibilities, even those that have traditionally fallen outside their respective fields. Judging from readily apparent indicators and projections, this will remain our work environment for quite some time. Therefore, it behooves everyone within the acquisition workforce to embrace the paradigm shift to developing expertise rather than becoming expert in any one field.

It is important to note that the diversity of expertise will not come easily. It will come at a certain cost in money, time and effort, all of which will fall on individual shoulders. Government organizations lack the training funds they had in the past. Even though a great deal of training and education is readily and freely available online through DAU, individuals will have to assume the cost of gaining certain expertise. In addition, the time away from work can seldom be afforded as more responsibilities are thrust on fewer employees. I believe that, more than ever, the motivated individual who is willing to accept the cost to gain expertise will excel in the acquisition workforce.

Workforce members should diligently seek training opportunities offered within their organizations. This would include taking part in project teams or working groups that provide

opportunities to learn project management disciplines the employee currently lacks. Workforce members should explore college programs and other educational opportunities. There may be opportunities within one's organization to cross-train with other departments, such as system administrators working in a network operations center rotating into the IA office for 6 months to develop IA skills.

It is important to realize that the path forward requires us to develop expertise and not focus on merely developing as SMEs in one discipline. Adopting this paradigm shift now will allow us to develop the skills needed within our profession as well as afford us more opportunities in the workforce. It also will enable us to perform the highly essential task of providing our warfighters with the capabilities they need to do their job, a job that is important to us all. 

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MDAP/MAIS Program Manager Changes

With the assistance of the Office of the Secretary of Defense, *Defense AT&L* magazine publishes the names of incoming and outgoing program managers for major defense acquisition programs (MDAPs) and major automated information system (MAIS) programs. This announcement lists recent changes of leadership, for both civilian and military program managers.

Army

(No new program managers this period.)

Navy/Marine Corps

Capt. Joseph Kan relieved **Capt. Paul Ghyzel** as program manager for the Navy Communications Satellite/Mobile User Objective System (MUOS) Program on Nov. 25, 2013.

Capt. Beau Duarte relieved **Capt. Jaime Engdahl** as program manager for the Unmanned Carriers Aviation Program on Oct. 17, 2013.

Air Force

Lt. Col. Robert J. Toren relieved **George Beck** as program manager for the Integrated Strategic Planning and Analysis Network (ISPAN) Increment 4 program on Aug. 28, 2013.

Fourth Estate

(No new program managers this period.)

Just in Time

Expecting Failure: Do JIT Principles Run Counter to DoD's Business Nature?

Col. Christopher J. Michelsen, USMC
Capt. Patrick O'Connor, USN ■ Lt. Col. Tarpon Wiseman, USA

The last several years witnessed both commercial industry and the Department of Defense (DoD) logistics supply chains trending toward an increased reliance on Just in Time (JIT) inventory management. Improvements in technology lending to affordable access at virtually every logistical level, coupled with nearly uniform success by businesses adopting such principles, drive this trend.

Both sectors pay specific attention to leveraging Web-based solutions primarily to gain efficiencies and reduce costs. Although they realize improvements through reduced distribution costs and warehouse management efficiencies, there may be hidden costs and risks associated with such reliance, particularly to DoD. These may include higher direct transportation costs driven by priority shipment directly to end users, decreased Operational Availability (A_o), increased ordering errors, and exposure to additional risks such as natural disasters. Everyone clearly understands the trend toward further incorporation of JIT principles because of their many merits, but as the all-encompassing environment evolves, everyone must also review the potential risks and consider associated costs.

Potential implementation of various risk mitigation strategies will enable DoD to achieve the best posture future logistics support for the warfighter, as implied in the Sept. 10, 2012, Capstone Concept for Joint Operations (CCJO). Subtitled "Joint Force 2020," this document identifies a security paradox of a world becoming more stable but simultaneously characterized by an increase in destructive technologies available to a wider group who wish the United States harm, making the current environment potentially more efficiently dangerous than ever. To keep pace with this changing environment, DoD must equal, if not surpass, our adversaries' efficiencies.

Michelsen is commanding officer, Blount Island Command and Marine Corps Support Facility—Blount Island. **O'Connor** is the supply division chief, Joint Staff J4 Directorate, and former supply officer on board USS Enterprise (CVN-65). **Wiseman** is scheduled to become a Joint & Combined Warfare School instructor, after having served as commander for 1-320th Field Artillery Regiment.



Commercial History

JIT is a management philosophy that ties inventory to management by combining many disciplines—including statistics, industrial engineering, production management and behavioral science—to expose hidden costs of keeping inventory. Such integration is believed to result in more efficient use of resources. Credit for developing JIT as a management strategy goes to Taiichi Ohno of the post-World War II Toyota Manufacturing Company. Ohno developed JIT strategy in the 1950s as a means of competitive advantage with profit maximization as the main goal. The concept supposedly sprang from the simple observation that when a customer pulled a product from a shelf, an empty, wasteful space was left. Understanding the significant capacity challenges at the time and identifying waste as the primary evil, Ohno categorized Toyota's empty "shelf spaces" as overproduction that resulted in dead stock and inefficient use of labor. Eliminating these hurdles became understood as the JIT philosophy, focusing in an overarching manner on moving items through a production system only when needed.

Equating inventory to an avoidable waste instead of adding value to a company directly contradicts traditional accounting. According to JIT, removing inventory exposes pre-existing manufacturing inefficiencies, a beneficial forcing function that constantly improves processes that drive inventory reductions.

Benefits Realized

Having success at Toyota, JIT rapidly gained popularity, if not outright envy, among the international business community. Such success caused several organizations to emulate Toyota's JIT-specific strategy over the years. JIT's next landmark came when it spread to America in the late 1970s and early 1980s. Today, many organizations such as Hewlett-Packard, Dell, McDonald's, Wal-Mart and others owe their success, at least in part, to the JIT management strategy. Such a system is beneficial to these companies for many reasons.

The JIT inventory system enables companies to fill customer orders when ordered. Such a capability is highly promising for companies like McDonald's and Dell. Instead of trying to sell customers premade burgers or computers that age quickly, these companies prefer to make it right when the customer orders and not before. Because the companies custom tailor all orders as opposed to reconfiguring previously completed products, JIT inventory enables more rapid production. JIT allows companies to satisfy orders at lower cost because tailored products are completed immediately upon request. Waste-conscious JIT companies only request enough material and generate enough products to complete orders that meet exact demand. They deliberately maintain restocking thresholds at very low levels in a further effort to eliminate waste and cost, maximizing profit margins and customer satisfaction.

Evolving Commercial Risks

Sole-Source Global Suppliers

Multiple known risks exist inherently with JIT management. Any company that becomes dependent on one main supplier

is conceivably at a disadvantage due to limited flexibility. Examples of such traumatic occurrences are common. The 1995 Kobe earthquake disrupted production of Toyota's sole supplier of brake shoes for domestic sales, affecting production at an estimated revenue cost of \$200 million. In March 2000, a lightning strike in New Mexico cost Ericsson cellphones more than \$2 billion in sales and by October 2001 Ericsson entered a joint venture with Sony out of necessity. A Japanese earthquake in March 2011 interrupted 25 percent of the world's silicon production, creating multiple significant events. A shortage of General Motors components caused GM to close its Louisiana plant for a week, Honda Motor Company to suspend orders for Japanese-built Honda and Acura models, and producers of Boeing's 787 to run billions of dollars over budget.

As a company's commitment to JIT principles increases, its vulnerabilities become greater. "Because what they do in just-in-time is remove all of the redundancies, and redundancies actually provide some margin for error," says James H. Costner, senior vice president of the property practice at Willis Risk Solutions, a contributor to Sony's "JIT Failure Case Study" in September 2010. As more businesses trend toward JIT management concepts, and reach across the globe in some cases to maximize cost reduction and efficiency, the effects of bad weather in some distant country influences production more than ever before. Gary Lynch, global leader of risk intelligence strategies and resiliency solutions at Marsh & McLennan Companies, says in the same Sony "JIT Failure Case Study": "Certainly what we've seen in a much more accelerated fashion has been the globalization of the supply chain, where the interdependencies are spread throughout the world."

Access Outpacing Control

The divide between levels of responsibility is disappearing as managers become empowered by leveraging Web-based technology. Specifically, executives largely retain overall responsibility, while relying on middle management to maintain an efficient budget and inventory. Although some control measures exist, the trend seems to be to provide lower-level managers with access to purchasing systems designed to spend money on behalf of the whole. Companies incur increased exposure to fraud and error from whoever gains access to these purchasing systems. Empowerment with limited oversight creates fertile ground for an increase in purchase errors. As fraud gets caught and errors are corrected, there is a direct correlation to an increase in returns and, accordingly, shipping costs. The big beneficiaries are carriers that increasingly rely on the virtual retail universe for triggering returns. UPS was expected to carry about 550,000 return shipments on the first business day of 2013 alone.

Mitigating the Commercial Risks

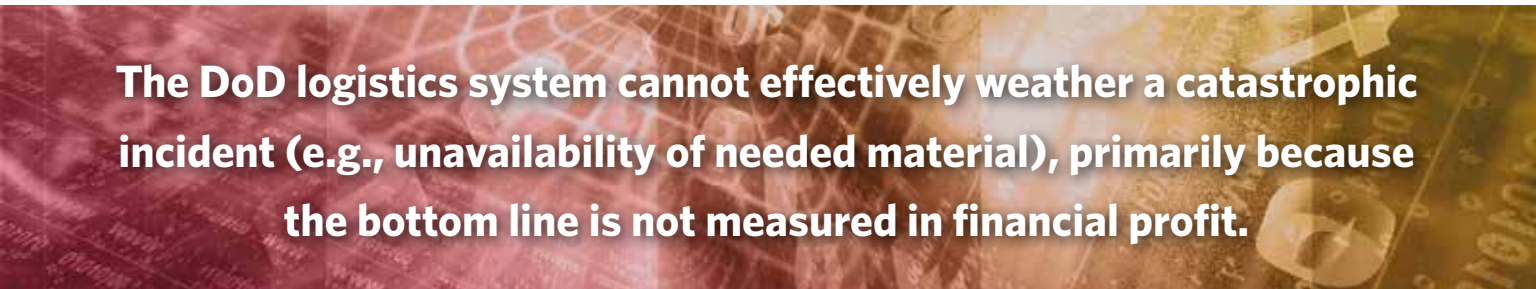
Only about 10 percent of U.S. companies have detailed plans designed to address supply disruptions, but even those contingencies do not fully take into account subsequent waves of consequences. For example, shortages may materialize over-

night in other countries as immediately needy companies seek alternative sources that could negatively affect short-term pricing and availability across the entire market. Some businesses secure more than one company to supply their needs at competitive prices, which is directly counter to the traditional JIT streamlined model. Many businesses avoid long-term contracts with suppliers to maintain influence over their supplying practices. Some companies diversify into manufacturing their own supplies as a means to eliminate outside source influence and variables, effectively bypassing a portion of the known risks associated with the JIT Inventory System. Despite the risks, incredible cost savings make companies extremely hesitant to abandon JIT inventory, says James Womack, founder of the Lean Enterprise Institute, in the online Bloomberg Businessweek magazine article titled “The Downside of Just-in-Time Inventory” by Susanna Ray and Thomas Black.

A promising method for countering some of the more catastrophic JIT risks comes from adopting the principles driving the concept of high-reliability organizations (HROs) outlined

utilized a “just-in-case” logistics system, largely characterized by older inventory tracking systems. High initial costs to procure and maintain inventories were common, with an increased likelihood of item failures for aged inventory. Obsolescence often resulted in high disposal costs as well, creating an overall inefficient logistics system. Following the end of the Cold War, the effort to realize a peace dividend caused dramatic DoD budget cuts and the subsequent quest for a more efficient logistics system. To reduce the cost of operating its forces while maintaining acceptable levels of readiness, DoD adopted JIT logistics and management principles.

While the significant benefits of JIT in the private sector are understood, they predominantly reflect decreased cost and increased profit, which are not the primary measurements of success in DoD. The nature of defending the United States and its national interests carries a different business culture and risk set, which must be considered when applied to DoD logistics. The CCJO’s Strategic Vision 2020 comes into play in the form of “globally integrated operations” as



The DoD logistics system cannot effectively weather a catastrophic incident (e.g., unavailability of needed material), primarily because the bottom line is not measured in financial profit.

in the book “Managing the Unexpected” by Karl E. Weick and Kathleen M. Sutcliffe. Weick and Sutcliffe reserve the term “HRO” for diverse organizations that have no choice but to be reliable: air traffic control teams, hostage negotiation teams, nuclear power plants, wild land firefighting crews, and others. This array of entities employ several practices in common that deviate from the norm of modern businesses. Most notably, they tend to expect failure (while most others at best “expect the unexpected”), they maintain a broad view of mindful awareness (as opposed to focusing on known or possible problems) and they deliberately organize infrastructure that facilitates maximum flexibility in response to emergency.

The theory and key point of the HRO concept is that by mirroring some of these proven practices, any company can reduce the severity and frequency of catastrophic events, accelerate recovery and facilitate learning. The principles are largely attitudinal, and while such a transition may require upfront costs, the enduring result will prove a cost benefit once the inevitable catastrophes occur.

JIT and New Risks Enter the DoD

As an instrument of national power, DoD requires a flexible, adaptable and responsive logistics system but must balance effectiveness with efficiency, especially in light of the conditions emphasized in the current CCJO. Before the early 1990s, DoD

used a way to streamline efficiencies and breed mutual support across the force.

Conceptually, globally positioned Joint Force elements combine with one another as well as mission-specific partners (be they interagency, foreign states or elements without borders) to integrate capabilities across all domains, echelons, affiliations and boundaries with a fluidity and quickness previously unseen. The vision specific to sustainment is in energy efficiency and implementation of the Joint Logistics Enterprise, with the three main goals of sharing resources, integrating logistics capabilities and sustaining logistics readiness. To sustain logistics readiness, the plan requires forward-positioned stock, balanced inventory levels and a fully utilized distribution pipeline. The four metrics measuring success of this end-to-end process include logistics response time, perfect order fulfillment, information content and quality, and total supply chain costs. In essence, the concept magnifies the need for organizational agility and flexibility, whereas JIT views stock, redundancy and multiple sourcing as wasteful. The concepts at broad brush are juxtaposed. If DoD is trending toward best business practices stemming from JIT principles, DoD also is trending away from the Strategic Vision 2020.

DoD uses high-priority transportation from established commercial vendors to reduce order and shipping time (OST),

thereby enabling a reduction in inventory levels. DoD must be careful to understand that the models are designed based on delivery in the Continental United States. Obviously, the most challenging portion of the logistics trail is found in the last mile. If retail stocks for end users are allowanced at a level based on a reduction in OST to, say, 3 days and does not consider the additional time needed to get replacements to an operational unit, mission accomplishment could be at risk.

Additionally, heavy reliance on highest-priority shipping due to reduced inventories can cost up to 20 times more than standard shipping. Due to “color of money” differences, those costs are not borne by the end user directly and, therefore, are not considered when choosing shipment modes and methods. This cost increase is assumed to be insignificant when compared to the savings associated with inventory reductions realized through JIT.

Another potential risk associated with JIT revolves around calculating A_0 . Different variables affect availability, and the tendency in some circles to overemphasize the importance of OST can negatively affect stocking strategies. JIT management consistently praises a decrease in OST as a reflection of an ability to reduce inventory on hand for operational units. This can be dangerous if a decrease in OST is assumed to outweigh the effect of other variables if they change, are made in error, or are not weighted properly. Consider as an example the importance of Mean Time Between Failures (MTBF)—quite simply, the time between failures of a particular component. Using what turns out to be the wrong MTBF for a component will produce a false A_0 by overestimating the component’s reliability. Because JIT relies on inventory reductions, a combination of such mistakes can prove quite costly.

Tying this concern to the civilian sector trend of access channels outpacing control measures is U.S. Transportation Command’s (TRANSCOM’s) Corporate Services Vision from November 2008, which identified an online model of mouse-click ease for product purchase and delivery as the model for military acquisition. In her “New Effort Taps Best Commercial Practices for Defense Acquisition” article for the American Forces Press Service, Donna Miles cited Robert J. Osborn II, TRANSCOM’s deputy director for distribution portfolio management, command, control, communications and computer systems at the time: “... [this] compared the effort to what a consumer experiences when buying an item online. The buyer simply keys in an item name to determine which vendors offer the product and at what price. Then the buyer selects a vendor and designates how quickly he wants delivery and how much it will cost. Finally, the buyer pays by a credit card and receives a code to track the shipment to delivery.” Although the new means integrates many redundant and arguably incompatible systems into a single, simple operation across the logistics enterprise, this could create ideal conditions for extreme error or deliberate manipulation. Eliminating steps in theory

reduces costs, but without significant control measures it can do anything but save money.

Weathering the Inevitable in DoD

As previously mentioned, the DoD logistics system cannot effectively weather a catastrophic incident (e.g., unavailability of needed material), primarily because the bottom line is not measured in financial profit. Overarching investment in JIT management with heavy emphasis on streamlined efficiencies is counterintuitive to the nature of DoD’s business, which historically relies on a system of redundancy to reduce risk and increase resiliency. JIT is a viable inventory management plan that DoD should continue to consider, but with a better understanding of the risks associated with a changing environment.

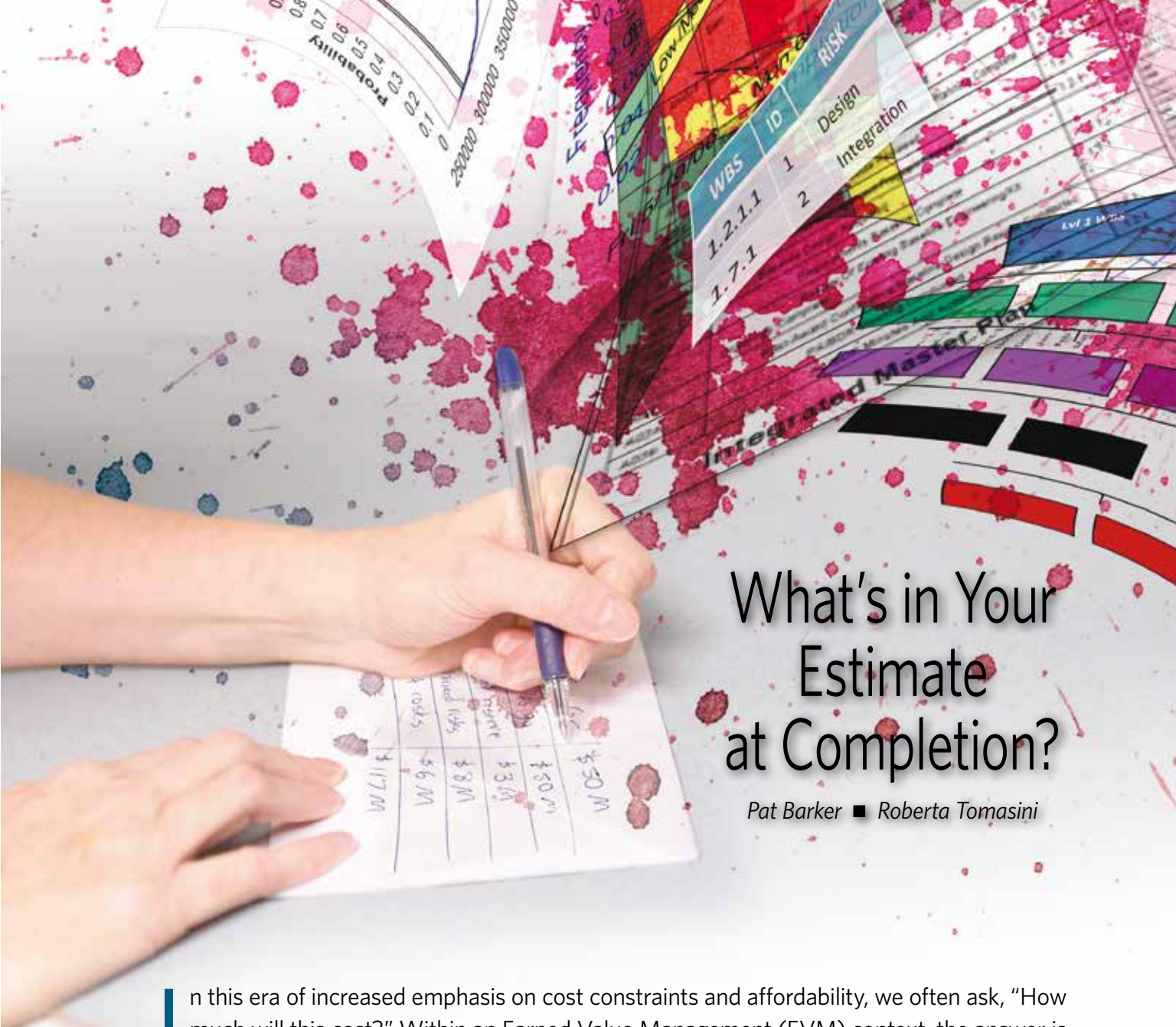
DoD must gain a better appreciation for potentially decreased availability of critical parts at the operational level due to streamlined supply chains and destructive weather. DoD also must gain a better appreciation for an increased reliance on high-priority transportation by measuring those costs and including them in the overall JIT computation. DoD must counterbalance the risks associated with flattened organizations that enable and encourage lower-level purchases and selection of delivery means. Mitigation techniques may include a proper balance of inventory on hand for critical operational units (e.g., CVN on station, Army/MC units in theater), forward-stationed inventory of the most critical spare parts (e.g., increased use of intermediate inventories in Bahrain) and increased scrutiny of other items affecting availability (e.g., MTBF).

To bring Ohno’s philosophy of “waste is the enemy” into better balance with the nature of an “in extremis” profession, DoD must take a closer look at HROs rather than relying on best business practices across the commercial sector. By gaining a healthy preoccupation with assumed failure, a reluctance to simplify problems and indicators, a true commitment to logistical resilience and deference to experience as opposed to rank or title, the organizational culture of DoD may mitigate inherent JIT risks effectively while maintaining the clear financial benefits.

Conclusion

The concept of JIT logistics supports DoD’s responsibility to maximize the effectiveness of limited resources but can come into direct opposition to DoD’s primary responsibility to win the nation’s battles. This dichotomy is analogous to the balancing of effectiveness and efficiency in a resource-constrained environment. For DoD to attain and sustain this balance, it must collaboratively develop and formally establish its JIT logistics strategy and nest with the Strategic Vision 2020. JIT logistics will continue to assist DoD in maximizing the effectiveness of its limited resources ... it just must be aware of and manage limitations. &

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What's in Your Estimate at Completion?

Pat Barker ■ Roberta Tomasini

In this era of increased emphasis on cost constraints and affordability, we often ask, “How much will this cost?” Within an Earned Value Management (EVM) context, the answer is found in the Estimate at Completion, or EAC. EACs are discussed in various venues from a technical manager’s office at a prime contractor facility to a crowded conference room at the Pentagon. All eyes become fixated on “the number.”

It is important for government program managers (PMs) to realize, especially as budgets tighten, that the EAC is more than just a number. The EAC is a gateway to insight on past, present and future program performance. The EAC numbers are the tip of an iceberg. Below the surface is a rich story describing why the numbers are what they are, how they were derived, and what they reflect. EACs provide insight and contributions to both government and contractor planning and management process execution.

Used as a leading indicator, an EAC provides a PM an opportunity to make proactive decisions. It is a pathway to explore not only whether a provider is likely to deliver on its promise, but whether the government PM can deliver within the cost, schedule, performance (C/S/P) constraints of the program’s Acquisition Program Baseline (APB). EAC discussions in the government program management office (PMO) are also excellent chances for the government PM to listen to what his or her staff thinks.

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EAC Insights

EACs are tied directly to the contract portion of the program threshold and objective costs in an APB. In addition, EACs provide a current estimate against the contract portion of the schedule and performance parameters in the APB. EACs therefore become a key consideration in exploring APB trade space with respect to C/S/P, to retain program affordability. Thus, EACs tell a story of real program integration.

EACs help clarify the influence of contractor overhead costs, general and administrative costs, and cost of money. Add in profit/fee and you get price, which takes you directly into budget territory: totals, phasing, obligations and expenditures. Thus an EAC discussion should be married with evaluation of a contractor's Contract Funds Status Report (CFSR) to assess whether the current time-phased budget and execution plan will support the latest EAC.

Given that usually two-thirds of a program's total ownership costs (TOC) reside "downstream" in the program life-cycle process, "upstream" EACs become important leading indicators of ultimate costs. Significant EAC changes demand near-immediate revisits to TOC estimates.

EACs also should reflect the reality of performance trends and forecasting. It is of paramount importance to compare EAC results with indices such as current and projected cost variance, schedule variance, Cost Performance Index (CPI),

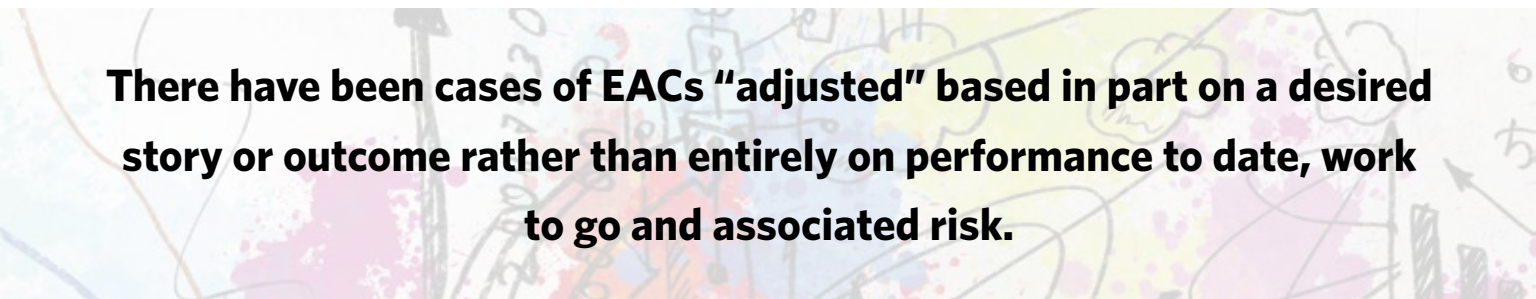
"adjusted" based in part on a desired story or outcome rather than entirely on performance to date, work to go and associated risk. For further exploration, see Table 1.

EACs Should Capture Risk

Most importantly, EACs give us a healthy look at risk assumptions.

Contractor-derived EACs are part of formal reporting artifacts such as the Integrated Program Management Report, or IPMR (formerly called the Contract Performance Report or CPR). Government PMO-derived EACs are intended to be compared to the contractor EACs. There ought to be some reasonable degree of traceability in each, from the initial assumptions through the derivation and into the final result.

Of all potential factors, the most significant differences between contractor and government EACs lie in risk and opportunity assumptions, which mean there is a range of potential EACs, typically reported as Most Likely (ML), Best Case (BC) and Worst Case (WC). The ML is the most commonly reported EAC, and is exactly what it sounds like: the "best guess" final result after considering all dynamics, risks and opportunities. A WC is the result anticipated if most risks become issues and few opportunities, if any, are captured. By contrast, a BC reflects most risks not materializing and most opportunities being capitalized upon (i.e., things mostly going right the first time). The range,



There have been cases of EACs "adjusted" based in part on a desired story or outcome rather than entirely on performance to date, work to go and associated risk.

Schedule Performance Index (SPI) and Variance at Completion (VAC). Every EAC drives a particular To-Complete Performance Index (TCPI), which is an important additional "reality check."

The derivation and reporting of a contractor EAC typically is associated with a detailed "bottoms up" analysis of work to go, which takes significant planning and assessment effort on the part of contractor control account managers (CAMs). Some organizations update their "bottoms up" EACs annually, others semiannually, some even more frequently. EACs also are expected to be assessed frequently (monthly) by each CAM via less-detailed means (in terms of planning) but with thorough consideration of performance to date using a variety of metrics and indicators.

The credibility of EACs can also be reflections of incentives, culture and/or trust. There have been cases of EACs

or spread, among these EACs reflects directly on the uncertainty associated with the program, starting with the first EAC on Day One of program execution. From a cost estimator's perspective, the range between BC and WC is typically the broadest toward the beginning of a program and typically the narrowest toward the end. The PM therefore should consider the cost estimator's perspective relative to EACs and their program budget. In addition, the PM can use the EAC range to be continually apprised of risk and opportunity and how much of each is assumed in the most likely EAC.

A "90-Second Back-of-the-Envelope" PM EAC Cross-Check

Many EVM training seminars and courses within and outside the Department of Defense (DoD) encourage students to focus on standard formulas when it comes to calculating EACs. The Defense Acquisition University EVM "Gold Card"

Table 1. Warning Signs for EVM (EAC) Reporting Issues

SOMETHING YOU MIGHT SEE THAT SHOULD "RAISE A FLAG"	WHAT IT MIGHT MEAN (AND IS WORTH A QUESTION OR TWO FOR CLARIFICATION)
A PM deferring to the "cost lead" or "EVM lead" to explain an EAC	Lack of PM comfort with EAC derivation, lack of PM familiarity with EVM.
EACs stagnant, not being updated at regular intervals	EAC development/assessment process that is either immature or atrophied. Lack of PM attention to EAC.
A volatile and "upwardly accelerating" EAC (changes significantly each month)	Weak (and disconnected) program planning, scheduling and EVM activities. Lack of anticipation and proactive decision-making.
Best Case (BC), Worst Case (WC) and Most Likely (ML) EAC are equal	Significant EVM process execution problems. Complete lack of risk/opportunity integration. Lack of understanding of what EAC represents.
ML EAC < BC EAC	EAC development/assessment process that is either immature or atrophied. Lack of PM attention to EAC.
ML EAC > WC EAC	EAC development/assessment process that is either immature or in atrophy. Lack of PM attention to EAC.
Exact or near-exact agreement between contractor EAC and government EAC	Government staff lacks comfort, experience with EVM. Likely lack of integration/interface between government EVM analysts and rest of government staff, especially technical staff.
Government EAC(s) consist solely of "Gold Card" formula results with little or no accompanying explanation/rationale	Government staff lacks familiarity with how to integrate risk and EVM. Likely lack of integration/interface between government EVM analysts and rest of PMO staff, especially technical staff.
Lack of robust explanation of EAC cost drivers	Lack of comfort, experience with EVM, and especially risk and EVM. Likely disconnect between Integrated Master Schedule, Schedule Risk Analysis (SRA) and EVM.
Exact or near-exact match of EAC to prominent cost-related contract elements such as BAC, TAB, Negotiated Price, PMO budget	EAC development/assessment process that is either immature or atrophied. PM lack of comfort with EAC derivation and/or lack of familiarity with EVM. Could reflect organizational culture of risk aversion. Could also reflect budget constraints.
Sustained high SPI	Premature claim of work accomplished. High percentage of "level of effort" earned value technique.
Sustained high CPI	High percentage of "level of effort" earned value technique combined with understaffing and/or substitution of lower labor rate personnel for higher rate personnel. Premature claim of work accomplished. Premature opening of work packages.
Contractor expenditures different than anticipated	Contract Funds Status Report (CFSR) misalignment with reported Actual Cost of Work Performed from CPR/IPMR. Must reconcile CFSR (with fee) to CPR/IPMR (without fee).
No reference in EAC to schedule forecast derived from SRA	Disconnect between scheduling discipline, EVM and risk management. Lack of cost adjustment to pay for "standing/marching army."
To-Complete Performance Index (TCPI) associated with the EAC is greater than the cumulative Cost Performance Index (CPI) reported to date	EAC might be unrealistic. A TCPI exceeding the CPI by 5% warrants pointed questions, and a 10% or greater difference warrants concern. It is rare for performance efficiency to increase by such a large margin unless fundamental changes to program management and execution are assumed.

is one of the most well-known references for widely accepted EAC formulas. One chooses a formula based on local conditions of cost performance, schedule performance and/or degree of program completion. As a general rule, these formulas have two components—actual costs to date and anticipated costs going forward. These anticipated costs are derived through dividing the budget of work remaining by an efficiency factor reflecting schedule and/or cost performance to date. While these formulas are effective and highly

capable of forecasting, they are not necessarily geared to foster a direct conversation on risk.

Therefore, this article offers a "90-second back-of-the-envelope" formula for government PMs. This formula is a simple cross-check that enables the government PM to discuss key entering arguments of a proposed EAC. This "back-of-the-envelope" formula and explanation of its terms is below. A specific example is shown in Table 2.

A Program Manager's 90-Second "Back-of-the-Envelope" EAC

Costs So Far + Budget to Go + Remaining Management Reserve + Dollarized Risks + Marching Army Costs

90-Second Formula Components Defined

Each of the 90-second formula components is defined as follows:

Costs So Far: An EAC should include program costs to date. These otherwise are known as "actual costs," "actuals" or ACWP (Actual Costs of Work Performed). They represent "sunk costs." The PM starts here by recording ACWP as reported in the CPR/IPMR.

Budget to Go: Second, an EAC should consider the budget for the remaining work. This is calculated by taking Budget at Completion (BAC) and the cumulative value for Budgeted Cost of Work Performed (BCWP) from the latest CPR/IPMR (i.e., BAC minus BCWP cumulative). This value is added to the ACWP.

Remaining Management Reserve (MR): DoD acquisition history for medium- to high-risk programs tells us odds are

a contractor has planned insufficient MR and will consume whatever it does have. Thus, we add all the remaining MR. The MR value can also be found in the CPR/IPMR.

Dollarized Risks: When it comes to quantified cost risk, contractors put a dollar value against each risk. These are dollarized risks. Furthermore, some contractors assess a probability value against each risk. They then develop a factored risk by multiplying the dollarized risk value by the probability. The resulting number is added into the EAC. By contrast, the back-of-the-envelope approach adds the full dollarized (not factored) risk value. The assumption here is that, though many risks may not be realized, other risks will continue to emerge until the end of the contract. Total dollarized risks can be found on the risk list or risk register. They also may be found in Format 5 of the CPR/IPMR. If there is not a dollarized risk list, try to get a rough estimate of the total value.

Marching Army Costs: When the contract end date schedule slips, everything slips, but people typically still get paid and overhead dollars still accrue. Multiplying anticipated contract end date schedule slip (in months) by an estimate of the contractor's "burn rate" when program slip is anticipated will do the trick for this term. A quick way to select the burn-rate value is to use the ACWP of the current period from the CPR/IPMR.

Table 2. Back-of-the-Envelope Example

Assumptions: Let's say a contractor has developed an EAC and reports its composition as noted in the table below. Taking out a small sheet of paper, the government PM can apply the 90-second back-of-the-envelope approach as shown below.

ROW	TERM	WHAT A CONTRACTOR MIGHT REPORT	THE GOVERNMENT PM'S "BACK-OF-THE-ENVELOPE" NOTES	NOTES ON GOVERNMENT PM'S ACTIONS
1	Actual Costs to Date	\$50 million	\$50 million	Extracted directly from Format 1 CPR/IPMR
2	Budget of work to go (BAC-BCWP)	\$50 million	\$50 million	Extracted directly from Format 1 CPR/IPMR
3	MR	—	\$3 million	Extracted directly from Format 1 CPR/IPMR
4	Risk/Opportunity	\$5 million (factored)	\$8 million (dollarized risks only)	Extracted directly from contractor Risk Register and/or Format 5 CPR/IPMR
5	Marching Army	—	\$6 million	Extracted from contractor SRA results for contract end date and current "burn rate" from CPR/IPMR. This is based on a 6-month contract end date slip at a burn rate of \$1 million per month
6	Total	\$105 million	\$117 million	

As a result, the PM's back-of-the-envelope EAC is \$12 million higher than the contractor EAC. This becomes a starting point for robust EAC conversation and an important catalyst for more detailed PMO staff analysis. The true goal is to reach a mutual understanding of the influence of risk in EAC derivation, not to determine that one EAC is more accurate than the other.

The government PM's staff can, and should, perform a more thorough analysis using its own methodologies while keeping the PM discussion questions at the forefront. Note that it may be necessary to replace contractor risk information (such as dollarized risk and SRA) with government information should the contractor information be determined to be inadequate.

Discussing the 90-Second Formula Components

These back-of-the-envelope formula components are not the final word for an EAC. Rather, each sets the stage for a robust and systematic EAC discussion.

Costs So Far: The reported actual costs might not truly reflect sunk costs. In some cases, portions of the reported actual costs are, in fact, estimated costs. This presents an opportunity for the PM to clarify the impact, if any, of these “estimated” actuals. For example, prime contractors typically utilize a large array of subcontractors, and subcontractors employ subcontractors. Accounting periods and invoicing across these “layers” often are not synchronized. The final “actuals” number likely could differ from the estimated number.

Budget to Go: Work remaining directly reflects work accomplished to date. A PM uses this term to discuss the contractor’s measurement of “percent complete.” How reasonable and/or robust is that measurement? What is really meant by 35 percent complete, 40 percent complete? An integrated master plan (IMP) becomes an excellent supporting tool for this part of the discussion.

Remaining MR: This term kicks off the program risk discussion. How did the contractor derive the MR? Was it pulled “across the board” using some factor like 8 percent or 10 percent (i.e., a management challenge) of negotiated cost? Does the factor differ between material and labor? How does this MR reflect the risk register content and nature of the work? How has the contractor been burning MR to date and

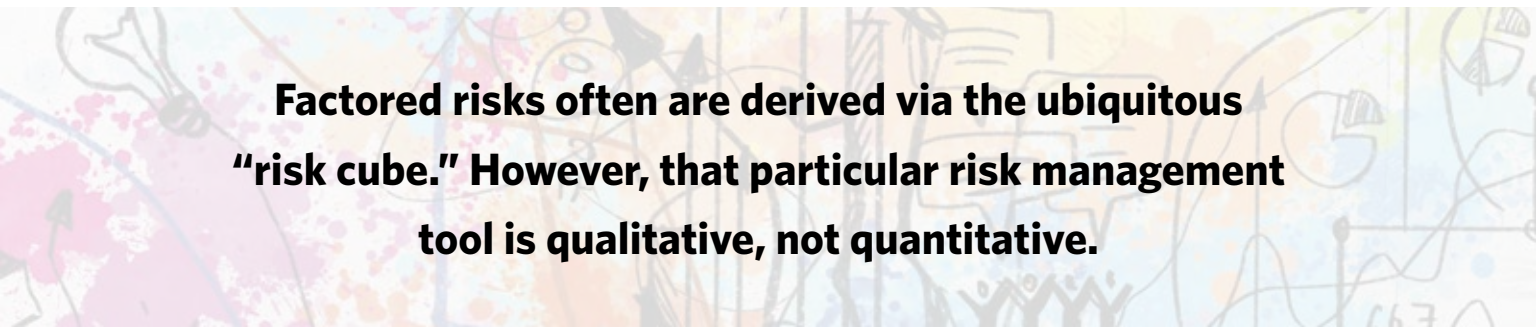
schedule risk analysis (SRA) was conducted, and to what degree its results influenced the EAC. An SRA accomplished in a manner consistent with industry and DoD expectations is an exceptionally powerful tool for PM insight and proactive decision-making.

Points of Order

A concern with this approach might be, “Wait a minute: MR plus dollarized risk plus schedule burn (marching army)? You are double and even triple-counting risk!” Where highly disciplined approaches to program management are encouraged and practiced, a “double” or “triple” count concern might be warranted. This formula assumes that this exceptional degree of discipline is not the case in most organizations.

It is often observed that not all risk considerations are created equal. MR, for example, often appears as a top-down “challenge” to managers, an across-the-board percentage cut at the beginning of the program. Derivation of MR levels and risk management assessments often are performed in separate venues and times. As a program’s risk management process spins up, risk impacts and mitigation costs are developed in various ways and often are loosely connected to MR levels.

In practice, the ubiquitous “risk cube” tends to be used as a basis for quantitative risk calculations. However, that particular risk management tool is qualitative, not quantitative. One person’s “high probability” is another person’s “low probability,” and it is hard to distinguish between how 35 percent versus 45 percent versus 55 percent was derived.



Factored risks often are derived via the ubiquitous “risk cube.” However, that particular risk management tool is qualitative, not quantitative.

for what purpose? How does the contractor factor into risk handling and forecasting? Has “disbursed” or “allocated” MR been reflected directly as work in the integrated master schedule (IMS)?

Dollarized Risks: This is an excellent opportunity to ask the hard questions about risk (and opportunity) assumptions and impacts. In particular, it sheds light on how risks actually are quantified in different organizations. The end result should be a mutual understanding of risk perspectives, even if the parties differ in their bottom line.

Marching Army Costs: Time is money, so this is an excellent opportunity for the PM to inquire how the contractor

The same goes for assessment of impact. It is nearly impossible to predict program-level risk impacts without the aid of program-level models such as a program cost model and an IMS. In short, true quantitative risk analysis results, factored into no-kidding quantitative numbers such as EACs, need more than a risk cube. A back-of-the-envelope tool merely opens the door for that discussion.

Best practice to the contrary, risk decision points, handling approaches and forecasting often are not directly reflected in the IMS in a way that models their respective influence on the program. Not all programs perform SRAs, and those that do so will not always integrate the results into the risk register, let alone the EAC. This 90-second approach

ACQUIPEDIA

ACQUISITION ENCYCLOPEDIA OF COMMON TERMS

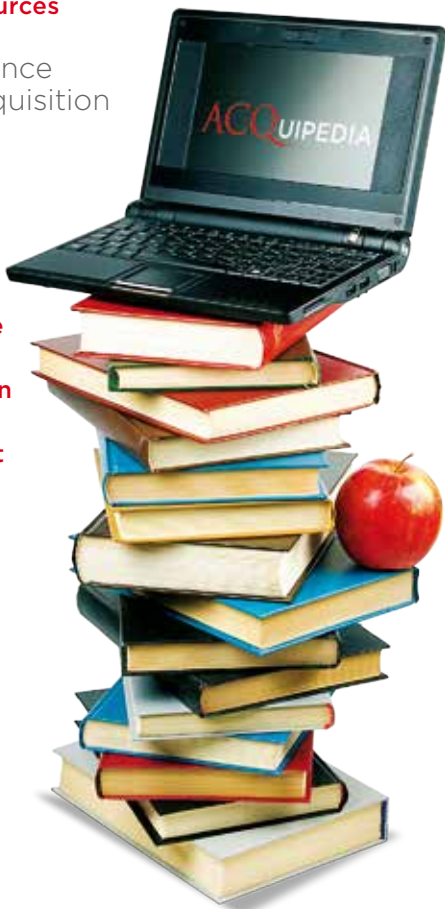
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delineates schedule risk and other risk considerations separately not because that is how it ought to be, but instead as a reminder to PMs to bring IMS considerations to the forefront of EAC discussions.

Opportunities could, and should be, assessed in a detailed EAC review. However, we assume strictly for our “back of the envelope” purposes that people are optimistic by nature and therefore we focus on risk and do not factor in opportunities, per se. Therefore, this approach fosters a discussion on opportunity (within which resides the topic of “should cost”).

The “Blind Side”

Acute awareness of the EAC and its derivation is important beyond the government and contractor PM conversation, because they aren’t the only ones who see, and interpret, an EAC. While we know EACs typically are reported within a contract through a deliverable such as an IPMR, EACs also find their way elsewhere. The contractor PM has his or her own command chain, all the way up to the chief executive officer, that will have an interest in—and influence upon—the EAC. On the government side, the EAC finds its way into program dashboards and briefings “up the chain” to program executive offices and acquisition executives in the Service or agency and in the Office of the Secretary of Defense (OSD). EACs are contained within Defense Acquisition Executive Summary (DAES) quarterly reports and DAES briefing charts. Selected Acquisition Reports contain EACs. EAC information gets pulled into other databases such as the Central Repository at the OSD level. The Defense Contract Management Agency (DCMA) assesses and reports on EACs. In short, EAC discussions take place in venues beyond the government PM’s zone of control, and lack of awareness can result in a PM being “blindsided” and unprepared at a most inopportune time.

The PM is expected to know the EAC and what it represents. By asking targeted and insightful questions about contractor EACs, he or she can help make EAC generation and review more efficient and effective. A “back of the envelope” approach enables tremendous insight into how the contractor accommodates risk within its performance measurement and forecasting functions and is one way for a PM to assess whether risk has been reasonably factored into a contractor’s EAC. Smart questions can “cut to the chase” quickly and discover elements or indicators that reflect process issues, clarify perspectives, prevent late-to-need information and foster proactive decision-making. A 90-second EAC is not the last word on a program EAC. It is but a cross-reference for a PM, a starting point for discussion, and a catalyst for more detailed government PMO staff analysis. Powerful EAC questions and robust EAC discussions put “affordability” in the forefront in a very real and productive way. &

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Bombs and Books

Building a Better Air Force Military Acquirer

Maj. Mike DiMaria, USAF
Maj. Chad Steipp, USAF

The Air Force (AF) develops some of the premier military business professionals in the world—but it can do even better. It has to if its next generation of leaders is expected to effectively navigate the ever-evolving defense acquisition landscape while simultaneously ensuring the materiel readiness of the force. The notion that the AF, and the Department of Defense (DoD), should invest in the professionalism of its workforce is widely discussed and seldom criticized. Examples of recent deliberation are easy to find.

Under Secretary of Defense for Acquisition, Technology and Logistics Frank Kendall's 2013 Better Buying Power initiative (2.0) explicitly added "improving the professionalism of the total acquisition workforce" as one of the initiative's six main tenets. A recent Center for a New American Security (CNAS) report suggested that a separate career track be developed exclusively to incubate the most promising military business professionals. Even recent congressional testimony on the state of acquisition reform stressed the need for a skilled defense acquisition workforce. There is no doubt that enhancing the acquisition profession through personnel development is a DoD priority. The development of military acquirers, with their recognizably unique status, should be no exception.

DiMaria serves in SAF/AQI (Information Dominance Directorate, Assistant Secretary of the Air Force Office for Acquisition) and has 12 years of active duty experience as an officer and enlisted Airman in multiple career fields. **Steipp** also serves in SAF/AQI and is a career acquisition officer with a background of service in various disciplines.

The military acquisition official is a unique breed of officer with responsibilities to be both savvy in the art of war and schooled in business, science, and engineering. He or she should be comfortable with both bombs and books. Methodologies on how to develop these officers vary across the Army, Navy, Air Force and Marines, but on average the Services seek a breadth of responsibilities for those tasked with increasing business responsibilities. The AF assigns acquisition officers beginning as second lieutenants and accesses others later in their careers who indicate a talent for the work. Frankly, the Service does an excellent job of managing its senior officers' acquisition assignments and produces some pretty impressive results, but do the officers chosen to manage the most challenging

Experience

Background in a military career field outside of acquisition helps an officer establish the AF "Why." In his seminal work "Start with Why," Simon Sinek extols the value of understanding the core reason for one's profession. All AF airmen, regardless of career field, should know and have a visceral belief in that reason. So the question is posed: Do all AF acquirers know "Why" the work they are doing for the AF is important?

Good leadership can and does inspire young acquisition officers to look beyond their immediate tasks to understand the bigger AF picture. However, it often isn't leadership, but unique experience that shapes an officer's view of his or her role in the

Not all acquisition officers experience the perspective-changing activities that occur in operational units. They should.

and important programs in the AF have the right skills to run the programs to which they are assigned?

After a critical look at three aspects of a career AF acquisition officer's development, the authors make three recommendations for improvement.

First, the current early career experience of dedicated AF acquirers is varied and inconsistent, often failing to instill the "Why" of the AF in its youngest officers. "Why" an AF acquirer is doing what he or she is doing for the AF should be just as clear to the young acquisition officer as it is to the pilot.

Next, it is also becoming increasingly apparent that it is not just the defense acquisition system with which an officer must be familiar, but the business world as a whole. Recent missteps in federal business system acquisitions have provided harsh reminders of the risks associated with technology development, regardless of their genesis in the public or private sectors.

Finally, the current acquisition certification program ensures a community of knowledge across defense acquisitions but fails to connect the officer with the broader professional worlds of program management and engineering. The benefits of grooming an officer by way of civilian professional certification should not be overlooked.

The AF attracts many talented young officers with the potential to become tomorrow's acquisition leaders. The goal is to develop as many as possible with the skills necessary to manage the most demanding programs. The AF can produce better military acquisition officers by implementing changes to experience, education and certification opportunities.

AF mission. That unique experience for acquisition officers, outside of formal developmental education opportunities, often is achieved through operational exchange assignments, deployments or a combination of both.

Unfortunately, acquisition officer deployment opportunities tend to ebb and flow with conventional force operational tempo. Deployments are a great way to connect the acquisition officer with the user community, but they alone cannot be counted on to inspire a program manager to get the right product to field on time and within budget. Operational exchanges offer an officer the opportunity to become immersed in an AF career field dependent on acquisitions to perform its function. Intelligence, maintenance and space operations units know their "Why." Not all acquisition officers experience the perspective-changing activities that occur in operational units. They should.

Recommendation No. 1: Mandate an operational exchange tour for all AF acquisition officers.

Mandating operational exchanges for acquisition officers would instill a baseline of AF core knowledge across the career field. Though it has organizational and management challenges, the idea of an operationally grounded acquisition officer corps is a step toward improving the career field.

Education

The education of an AF acquirer should extend beyond the bounds of the defense acquisition community. Currently, AF acquisition officer professional education consists of a basic in-residence class followed by on-the-job training and numerous resident/correspondence courses offered by Defense

Acquisition University (DAU). This is a good process, but it is decidedly DoD-centric. Acquisition is an international business function, one arguably not confined to the tenets of the defense acquisition system.

While it makes sense to ground acquisition professionals in defense principles, it is important to consider the value of building knowledge through additional education. Often that additional education comes in the form of an advanced academic degree (AAD) pursued part-time in addition to military duties or full-time at an in-residence setting. There are many excellent AAD opportunities, allowing the vast majority of acquisition officers to achieve degrees in business, systems engineering, engineering or related academic fields. The current in-residence AAD options for AF acquisition officer strongly focus on engineering. This ultimately produces a Service acquisition professional who is technically sound but not necessarily educated in commercial best practices or advanced business management techniques. There currently are no opportunities for AF acquisition officers to attend full-time business-specific programs at civilian institutions. One way to augment the current acquisition education framework and introduce business principles common to the private sector is to offer AADs in business management at civilian institutions.

Recommendation No. 2: Offer opportunities to attend civilian business schools in residence.

Offering select acquisition officers the opportunity to attend a civilian business school in residence would improve the AF connection with the private sector, ensure continuity with international business practices and incentivize officers to pursue knowledge that ultimately benefits the AF. Though there

the government acquisition professional does not necessarily mirror the contractor counterpart. More to the point, while evaluating companies that can execute our requirements and stay within cost and schedule, the government looks for certain certifications of both individuals and companies. Doesn't it make sense for us to require our workforce to have the same qualifications? This leads to our third recommendation.

Recommendation No. 3: Mandate the achievement of a civilian program management professional (PMP) and/or professional engineer (PE) certification.

We propose that upon pinning on the rank of major (O-4), and before the assumption of lieutenant colonel (O-5), there needs to be a requirement, tied to acquisition corp eligibility, to gain either PMP certification or the PE certification.

The PMP and PE are internationally recognized certifications underpinning professional expertise in the program management and engineering career fields. Yes, they cost money to complete and would impose a demand on an officer's time, but they go a long way toward the government confidently owning its technical baseline. Without these bona fides, the government remains somewhat reliant upon the contractor community for programmatic and engineering support. With them, the AF acquisition officer corps could lead business activities well into the future.

Conclusion

Changes in the experience, education and certification opportunities for AF acquisition officers will yield more personnel with the skills to lead the most demanding AF programs. Experience in the form of a mandatory operational exchange will

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are many questions to be answered about how to fund such a program and the appropriate timing in an officer's career, the fact remains that the AF would benefit from acquisition officers attending top-ranked business schools.

Certification

DAU currently offers a rather robust defense-specific continuing education curriculum. There is little debate about the value of the present system, as it provides necessary insight into the nuances of defense acquisition. However, the certification of

instill in an acquirer the reason for the work. Education through civilian business schools will ensure a current and relevant connection with industry. Certification in program management or professional engineering will help the AF own its technical baseline. Individually, each of these recommendations has the potential to improve the skills of some AF acquisition officers. Collectively, they can change a whole career field. 🔄

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The Fate of Sgt. Smith

Restriction on Non-DoD Conference Travel

*Col. Paul Barnes,
USAFR, Ph.D.*

The laboratories and testing centers in the Department of Defense (DoD) are primary sources of technological innovation in making our warfighters more mission-capable. A large number of facilities within each of the three Services—the U.S. Air Force, the U.S. Navy and the U.S. Army—are dedicated to providing the U.S. military with its technological edge through research, development, test and evaluation (RDT&E) centers. Although the U.S. Marine Corps (USMC) has activities in RDT&E, they are largely provided by the U.S. Navy.

There are various categories of research and development, but let's look at what is considered fundamental research. This refers to basic research and applied research. Basic research is systematic study directed toward greater knowledge or understanding of the fundamental aspects of phenomena and of observable facts without specific applications in mind (6.1 funded). Applied research is the systematic study to gain knowledge or understanding necessary to determine the means by which a recognized and specific need may be met (6.2 funded).

A great advantage of research, especially fundamental research, is that it enables our Services to start fighting the enemy on the battlefield 10 to 15 years in the future. As with most activities, the greater the funding the better;

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however, budgets always are limited and it is necessary to get the most out of the funds available. This includes both adopting new policies/practices and shedding existing ones that interfere with generating great research in support of military systems development.

A current policy that is greatly detrimental to advancing fundamental research but readily fixable is the specific restriction on attending conferences not organized by DoD. This does not refer to the general DoD policy that reduces travel. The general restriction on travel is to reduce its relative proportion of the budget. Limited budgets mandate restricted expenditures. There can be debates on what is the proper size of a travel budget, and it will vary from one activity to another depending on mission requirements. This general restriction accounts for this by setting expenditure levels at a percentage of previously allotted expenditures. The specific restriction on attendance at any non-DoD conference is not

a budgetary issue since it is prohibited even if deemed important to fit in the reduced budget (more on exceptions later).

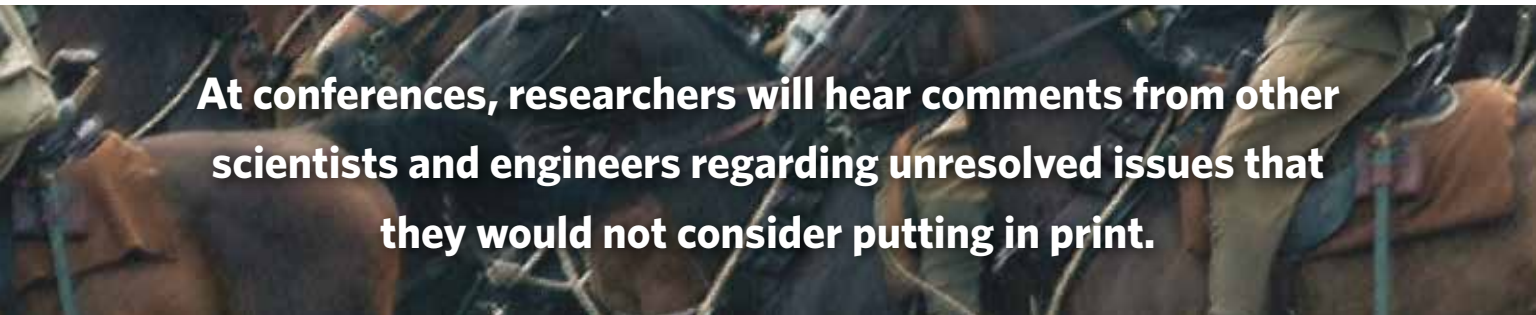
The restriction on non-DoD conference attendance may seem like a generally good idea on the surface. If it is not sponsored by a DoD agency, then it cannot have as great an importance to the DoD. However, this ignores the fact that some activities, specifically fundamental research activities, have very different needs than other activities. Non-DoD research conferences are critical to fundamental researchers. In fundamental research, the DoD does not generally provide appropriate conferences or forums since the best and most useful conferences largely are organized by well-established scientific and engineering societies or commissions. Conferences are organized by boards and panels consisting of peer-recognized experts in particular disciplines. These individuals come from academia, industry and government

agencies (including DoD, interestingly enough). I do not refer to conferences discussing applied technical directions, but the hard-core science and engineering conferences where detailed fundamental research is discussed in open forums.

Let's review the general advantages of attending these non-DoD conferences. Attendance allows researchers to efficiently assess other research that can be synergistically melded into their own research, allowing new discoveries. This can be simply phrased as putting all the puzzle pieces together; however, you must have all the pieces, or at least enough of them to see the picture clearly enough. Reviewing only the published literature is not sufficient. At conferences, researchers will hear comments from other scientists and engineers regarding unresolved issues that they would not consider putting in print. However, these issues provide incredible insights. They may occur during the formal presentation, the question-and-

from the previous 1 to 2 years. Conferences allow assessment of the latest "developments," especially since researchers often will vet their research at a conference before putting it in print. This enables researchers to ensure they covered every angle (based on feedback at the conference) before publication. As a result, these non-DoD technical conferences generally are superior, with excellent attendance by academia, by industry and (should I add "previously") by government.

Some may state that such attendance still may be allowed within the present system, if approved for an exception. However, approval is required by Service secretaries and major commands (passing through an extensive chain of command along the way) accompanied by 1 to 2 inches of documentation gathered to support the reasoning. This is a tremendous effort that has demonstrated a small chance of acquiring an approval. We also should ask whether anyone completely



At conferences, researchers will hear comments from other scientists and engineers regarding unresolved issues that they would not consider putting in print.

answer period, or even at informal sidebars in the corridors. Often, a difficult issue may not be resolved without input from others, which spurs researchers to share such partial information at conferences.

There are other reasons for attending non-DoD conferences. Attending allows the researcher to steer the community toward research issues relevant to the DoD. Leading researchers have a strong influence on the direction of research, and it is in face-to-face discussions at these conferences and workshops where it is most effectively leveraged. In addition, the scientist or engineer can better assess the proper direction and/or appropriateness of their research by the response of their peers. This may occur during the presentation, but often on the side between sessions. On a simpler note, odd data may turn out to be just a collection issue, but identifying this allows the researcher to correct the issue and move on. A collective review by others with different insights either will help resolve the problem or validate the idea that there is no problem. Either way, the proper meaning of the information or data then is obtained.

As research is wrapped up in one particular aspect, attending non-DoD conferences sponsored by well-established scientific and engineering societies will allow the scientist or engineer to assess new development areas for exploration. Journal papers are very important in providing detailed documentation of what was accomplished; however, they consist of research

reads the documentation other than the people who assembled it. The exception process places on the researcher an administrative burden to be accomplished before the projected abstracts for the conference are issued. That unfortunately reduces the requests in general without ensuring the approval allowance to the more important requests (that doesn't mean this is intentional).

While the directors of the Service laboratories openly marvel at the lack of understanding of the scientific development process that caused such a restriction, it is unclear why the policy has not yet changed. It is not due to tight budgets since the laboratory directors would approve the travel as their top priority even with the tight budgets imposed. If controls are desired, it would be better to restrict attendance at non-DoD conferences to those who are giving a technical presentation. This often is an unspoken rule of thumb. Scientific organizations gauge in part a researcher's effectiveness by papers presented at a conference and the type of presentation that was made. There are even gradations as to the type of presentation or participation: plenary speaker, invited speaker, oral speaker, poster presenter, session chair or simply conference attendee. One could use these designations as well, or simply allow approval at the laboratory director level. These suggestions would provide a much more efficient process.

Since it may be difficult to see how this conference travel restriction could hurt the warfighter directly, I will provide the

following scenario. Dr. Lilly Prudence was invited to attend an international conference in Europe to discuss her groundbreaking work on device failure physics related to oxide trapping. She knew this research would necessitate a change in current reliability standards. However, she had to turn down the invitation due to the non-DoD conference travel restriction. Because she did not attend, she missed two talks that clarified a subtle but critically important secondary effect. When melded with her research, it more fully justified the need for better standards. It was not clearly obvious and was not pointed out by Lilly because she was not there. She was also unable to persuade the detractors of the critical need for improved standards and missed research presented that would have helped her own research efforts. Synergistic effects and a subsequent missed conference delayed that research by about 3.5 to 4 years.

Lilly eventually read the articles by the others and was able to communicate via written exchanges, slowly moving the research and interest along. With this accomplished, she identified how to initiate proper changes in the reliability standards for devices made with the new electronics material. Again, making the proper changes to the reliability standards was slow going since Lilly was unable to rapidly disseminate the information at conferences, but her persistence via communications and written papers eventually paid off. It was only an additional 2 years extra time to get the community energized to tackle the issue. With the community engaged, she established DoD forums outside of conferences to address the issue. A few were unable to attend, complaining that the DoD should have the forums as part of the disallowed non-DoD conferences to reduce their travel costs. Even so, that only slowed the effort by another few months.

With the new reliability standards finally in hand, manufacturers now were ready to gear up production of the electronic devices on the new-grade material based on effective reliability test standards advocated by Lilly. Meanwhile system contractors continued using the older technology since the military could not accept the new electronics due to reliability concerns. This delayed for several years the fielding of a new sensor array for detection of insurgents around outposts. In the meantime, the United States had initiated military action in the nation of Terrorist Haven due to a U.N. resolution. An army squad was positioned in an outpost established to inhibit a suspected enemy supply trail. Since the new detection system was not yet in place, insurgents were able to raid the camp and expel the U.S. forces, killing Sgt. John Smith during this action. The United States quickly responded and repulsed the insurgents a day later. Even though the United States won a tactical victory in this particular action, the insurgents were able to use the capture of the outpost (albeit temporary) to gather additional funding and recruits for their activities, which they then used on a domestic terrorist plot that ...

While the foregoing story is fictitious, it illustrates the potential unintended consequences of this non-DoD conference travel restriction. The death of a soldier in the future is just as bad as one in the past, unless by projecting it we can save his life, avoiding the subsequent consequences as well, especially when the solution is simple. Funds are limited and must go to various places and agencies to resolve ever-present issues, but let us spend those funds effectively and efficiently without a specific restriction on non-DoD conferences. &

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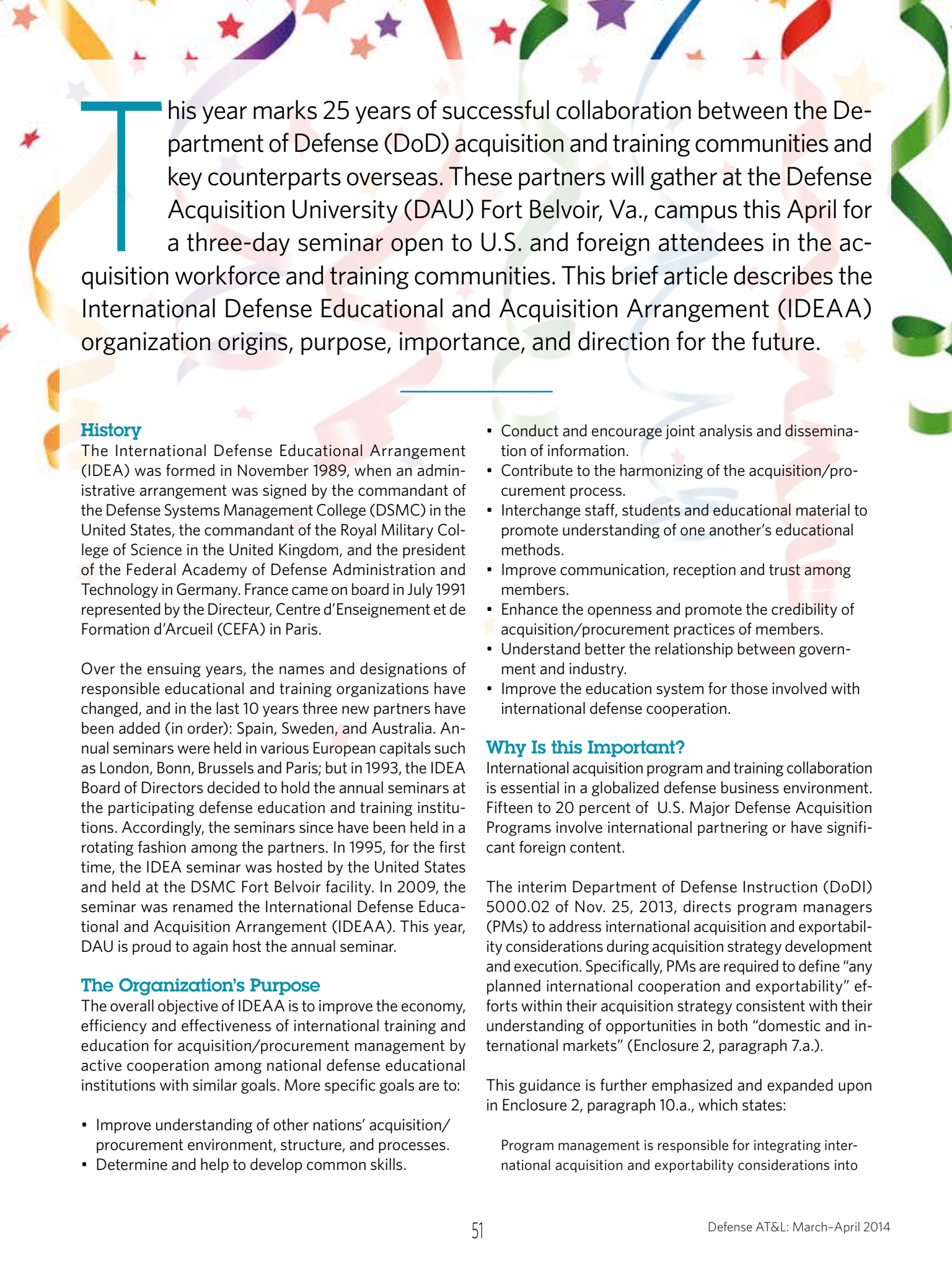




IDEAA Celebrates Its Silver Anniversary

Duane "DT" Tripp

Tripp is the Director of International Programs for Defense Acquisition University and is a retired Air Force colonel with more than 20 years of international acquisition experience. He served as director for Air Force and Army Programs at HQ JUSMAG-K in Seoul, Korea, and as chief of both the Pacific Division and the Armaments Cooperation Division for the Secretary of the Air Force/International Affairs.



This year marks 25 years of successful collaboration between the Department of Defense (DoD) acquisition and training communities and key counterparts overseas. These partners will gather at the Defense Acquisition University (DAU) Fort Belvoir, Va., campus this April for a three-day seminar open to U.S. and foreign attendees in the acquisition workforce and training communities. This brief article describes the International Defense Educational and Acquisition Arrangement (IDEAA) organization origins, purpose, importance, and direction for the future.

History

The International Defense Educational Arrangement (IDEA) was formed in November 1989, when an administrative arrangement was signed by the commandant of the Defense Systems Management College (DSMC) in the United States, the commandant of the Royal Military College of Science in the United Kingdom, and the president of the Federal Academy of Defense Administration and Technology in Germany. France came on board in July 1991 represented by the Directeur, Centre d'Enseignement et de Formation d'Arcueil (CEFA) in Paris.

Over the ensuing years, the names and designations of responsible educational and training organizations have changed, and in the last 10 years three new partners have been added (in order): Spain, Sweden, and Australia. Annual seminars were held in various European capitals such as London, Bonn, Brussels and Paris; but in 1993, the IDEA Board of Directors decided to hold the annual seminars at the participating defense education and training institutions. Accordingly, the seminars since have been held in a rotating fashion among the partners. In 1995, for the first time, the IDEA seminar was hosted by the United States and held at the DSMC Fort Belvoir facility. In 2009, the seminar was renamed the International Defense Educational and Acquisition Arrangement (IDEAA). This year, DAU is proud to again host the annual seminar.

The Organization's Purpose

The overall objective of IDEAA is to improve the economy, efficiency and effectiveness of international training and education for acquisition/procurement management by active cooperation among national defense educational institutions with similar goals. More specific goals are to:

- Improve understanding of other nations' acquisition/procurement environment, structure, and processes.
- Determine and help to develop common skills.

- Conduct and encourage joint analysis and dissemination of information.
- Contribute to the harmonizing of the acquisition/procurement process.
- Interchange staff, students and educational material to promote understanding of one another's educational methods.
- Improve communication, reception and trust among members.
- Enhance the openness and promote the credibility of acquisition/procurement practices of members.
- Understand better the relationship between government and industry.
- Improve the education system for those involved with international defense cooperation.

Why Is this Important?

International acquisition program and training collaboration is essential in a globalized defense business environment. Fifteen to 20 percent of U.S. Major Defense Acquisition Programs involve international partnering or have significant foreign content.

The interim Department of Defense Instruction (DoDI) 5000.02 of Nov. 25, 2013, directs program managers (PMs) to address international acquisition and exportability considerations during acquisition strategy development and execution. Specifically, PMs are required to define "any planned international cooperation and exportability" efforts within their acquisition strategy consistent with their understanding of opportunities in both "domestic and international markets" (Enclosure 2, paragraph 7.a.).

This guidance is further emphasized and expanded upon in Enclosure 2, paragraph 10.a., which states:

Program management is responsible for integrating international acquisition and exportability considerations into

the program's Acquisition Strategy at each major milestone or decision point. Program management will consider the potential demand and likelihood of cooperative development or production, Direct Commercial Sales, or Foreign Military Sales early in the acquisition planning process; and, where appropriate, program managers will pursue cooperative opportunities and international involvement throughout the acquisition life cycle to enhance international cooperation and improve interoperability in accordance with DoD Instruction 2010.06.

The importance of this increased emphasis on international acquisition and exportability in the recently released interim DoDI 5000.02 is based on two fundamental principles:

- Allied and friendly nation participation in DoD acquisition programs builds partner nation capabilities, increasing their national and coalition operational effectiveness.
- Partner nation involvement in our programs' development, production, and logistics support results in both direct and indirect cost savings, markedly enhancing U.S. and partner nation affordability throughout the life cycle.

Efforts that strengthen and focus collaborative partnering pay "real money" dividends as well by using strategies to enhance program affordability. Some of these "dividends" can be realized during the various acquisition phases:

Technology Maturation & Risk Reduction	<ul style="list-style-type: none"> • Access to foreign technology can reduce technology development cost and risk. • Foreign Nondevelopmental Items can reduce/avoid development.
Engineering & Manufacturing Development (EMD)	<ul style="list-style-type: none"> • Research, Development, Test and Evaluation costs can be shared. • Foreign test facilities can be used at reduced costs.
Production & Deployment	<ul style="list-style-type: none"> • Nonrecurring costs can be shared. • Economies of scale available through defense sales.
Operations & Support	<ul style="list-style-type: none"> • Sharing of nonrecurring modernization and upgrade costs. • Creation of overseas support footprints.

Since PMs are required to address international acquisition and exportability considerations, and affordability benefits can be gained, organizations like IDEAA can be vital tools. The question often is not "can we afford the time and effort to participate," but perhaps, "can we afford not to?"

This Year's IDEAA Seminar

Subject to scheduling issues, this year's seminar will be key-noted by Under Secretary of Defense for Acquisition, Technology and Logistics Frank Kendall and the Assistant Secretary of Defense for Acquisition Katharina McFarland.

The first day will include presentations and discussions of the new DoDI 5000.02 changes including emphasis on international acquisition program areas and related DoD Better Buying Power Initiatives. Similar activities will be presented from the acquisition communities of key, selected foreign partners. Several panels will explore international acquisition program benefits and challenges while offering thoughts on future objectives.

The closing discussions of the day will include practitioner perspectives from "successful"—and "unsuccessful"—programs. The highlight will be a presentation summarizing 40 years of DoD program problems and the reasons for those problems. They probably will surprise attendees.

The second day will focus on training best practices, innovations and required evolution to cope with the challenges in acquisition programs described during the first day's discussions.


The third day will incorporate smaller group sessions designed to take some of the core issues to a more detailed level while encouraging attendee interaction and feedback. This is the chance to ask penetrating questions and engage in substantive discussion.

IDEAA's Future Direction

First and foremost, this year's seminar at DAU will be an important event for vital collaboration in a global defense environment that seeks affordability and other objectives through international cooperation.

The organization is working to structure its successful long relationship into a formal agreement that will serve as the basis for exchanges of more and more complex information and even faculty and/or students. It will allow the joint funding, execution, and publication of research important for better acquisition outcomes in the future.

There are ongoing workshops and seminars held between two or more partners each year to enhance their acquisition training. In addition, a major project is under way to re-create and expand several volumes of comparisons of the partner countries and other countries' acquisition systems so we may operate more effectively.

In short, the IDEAA directors are working hard, and planning carefully to enhance our collective and individual skill sets and processes to do the tough job of acquisition better. Participation from our acquisition and training communities is key. Come participate. We need your experience and ideas! 

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Defense AT&L

Writers' Guidelines in Brief

Purpose

Defense AT&L is a bimonthly 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.

Submission Procedures

Submit articles by e-mail to datl@dau.mil. Submissions must include each author's name, mailing address, office phone number, e-mail address, and brief biographical statement. Each must also be accompanied by a copyright release.

Receipt of your submission will be acknowledged in 5 working days. You will be notified of our publication decision in 2 to 3 weeks. All decisions are final.

Deadlines

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

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

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 seeks articles that reflect author experiences in and thoughts about acquisition rather than pages of researched information. Articles should discuss the individual's experience with problems and solutions in acquisition, contracting, logistics, or program management, or with emerging trends.

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 suitable for DAU's journal, *Defense Acquisition Research Journal (ARJ)*.

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

Length

Articles should be 1,500–2,500 words.

Format

Send submissions via e-mail as Microsoft Word attachments.

Graphics

Do not embed photographs or charts in the manuscript. Digital files of photos or graphics should be sent as e-mail attachments. **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; and 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.

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