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Leaning Into the New Year
Under Secretary of Defense for Acquisition and Sustainment

Creative Thinking Is the Cornerstone of Critical Thinking

Making the Most of Scientific Test and Analysis Techniques

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22 Adaptive Acquisition: A Cure for Contract Inertia
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The three steps in change management are: unfreeze (prepare for the desired change), change (implement the desired change), and refreeze (solidify the desired changes).

A Portfolio Management-Based Acquisition Model?
Brian Schultz
The requirements and acquisition communities must collaborate and work in a more integrated manner. Acquisition expertise provides the technical, engineering and business knowhow; requirements managers provide the mission expertise.

Reducing Barriers to Workforce Innovation
Robert Frum
An organizational innovation framework improves the opportunity for maximizing positive change from ad hoc to a systematic approach for success. Innovative index probabilities provide an objective measure of an organization’s innovation culture.

Squeezing More Value From Test
Lt Col David Petrucci, USAF
A program office practice could be elevated to the Configuration Steering Boards to help make better-informed decisions on verification program adjustments and squeeze more value out of test.

Coast Guard Role in the Great Power Competition
James Landreth, P.E.
The Coast Guard offers unique contributions to national security and must maximize its utility and ensure the viability of its long-term investments.

2019 Defense Acquisition Workforce Awards
2019 Packard Awards for Acquisition Excellence
A NEW YEAR HAS BEGUN FOR OUR team. We continue using the mo- mentum built thus far to propel us forward. Take a look at where we have come from.

On Feb. 1, 2018, we stood up the new Acquisition and Sustainment (A&S) organization as mandated by Congress—and on Sept. 4, 2018, we had our first official day as a reorganized department. Of course, we used this opportunity to better shape our organization and acquisition system to meet the demands of the 21st century. Even while leadership has changed, our mission endures: Enable the Delivery and Sustainment of Secure and Resilient Capabilities to the Warfighter and Internal Partners Quickly and Cost Effectively. Our National Defense Strategy was instrumental as we built departmental norms and strategy.

A&S employees at all levels are driving the organization forward together, full speed ahead with several significant projects.

For starters, the Adaptive Acquisition Framework has been introduced, along with a rewrite of what had become a cumbersome document, the Department of Defense (DoD) Instruction 5000 Series. This way forward removes a longstanding system of bureaucracy and red tape by turning the procurement process into one that empowers users to be creative decision makers and problem solvers. The acquisition workforce will choose between a set of established pathways and timelines—specifically designed for a diversity of purchases—requiring different levels of urgency. Using the new policy, acquisition professionals will be given autonomy, within legal parameters, to churn up tailored solutions. All of these revisions should allow for DoD partnerships with commercial industry in real time, enabling the DoD to keep products up to date with emerging technologies, and delivering capabilities “at the speed of relevance.”
Improving program sustainment outcomes for the F-35 fighter jet is another top priority for A&S. Developed to replace multiple U.S. fighter jets with a platform that maximizes commonality, and therefore economies of scale, the DoD has fielded three configurations to satisfy United States Air Force, United States Marine Corps, United States Navy and multiple international partners’ tactical aircraft requirements. A&S is dedicated to achieving the DoD’s aim for an 80 percent mission capability rating by defining performance imperatives, metrics, establishing detailed success elements and applying commercial best practices. These efforts help ensure a ready and affordable fleet of fifth-generation fighters critical to preserving air dominance both for the United States and our allied partners in this era of strategic competition.

Like anywhere else, DoD systems are enabled by hardware but are defined by the software used. With the technology industry innovating quickly, the DoD must figure out how to keep up with fast moving software development and life cycles. By engaging Agile and DevOps methods for more iterative processing, end users will be involved earlier and more often, enabling continuous integration and helping the DoD meet its goal to develop and sustain software simultaneously. Based on recommendations by the Defense Innovation Board, a new software acquisition policy of approaching the challenge from the business side is being finalized to allow for these more rapid techniques. Pilot programs are rolling out to define corresponding procedures even further. Along these lines, the DoD has asked Congress to specifically appropriate money for defense software and is awaiting budget review and National Defense Authorization Act spending decisions.

The Cyber Security Maturity Model Certification (CMMC) was developed (using the best industry standards) to ensure the cyber hygiene of the Defense Industrial Base is complete and protects critical information in the DoD. As part of the CMMC, a consortium of unbiased parties will oversee the training, quality and administration of a third party that will certify that industrial base partners uphold accepted standards. This effort was spearheaded by our Acquisition team in working to roll out version 0.6 of the model by November 2019 and version 1.0 by the first of this year. The consortium is to begin training and accreditation of certifiers with certification beginning by June. Contracts will be required to include this certification in their evaluation criteria, beginning this October.

Chemical agents Perfluorooctane Sulfonate (PFOS) and Perfluorooctanoic Acid (PFOA) are part of a larger chemical class known as Per- and Polyfluoroalkyl substances (PFAS). Following a health advisory issued by the Environmental Protection Agency that warned against PFAS chemicals in drinking water, studies discovered the presence of the harmful agents in many industrial and consumer products, including nonstick cookware and microwave popcorn bags.

In DoD applications, the chemicals have been found in firefighting foam used to rapidly extinguish fuel fires. Although successful in protecting against catastrophic loss of life and property, it is now known that the release of PFAS can potentially contaminate private wells and public water systems. A national committee and a task force were established to provide an aggressive, holistic approach to find and fund an effective substitute for firefighting foam without PFAS, develop and implement cleanup standards, make lasting policy change, and coordinate across federal agencies. The DoD discontinued land-based use of the firefighting foam in training, testing and maintenance. Now, when the foam is used in emergencies to save lives, releases are treated as a chemical spill. Affected soil is contained and removed, to ensure that no additional PFAS pollute the groundwater. The DoD has identified 36 drinking water systems containing unsafe PFOS and PFOA—some of those systems are servicing military installations and surrounding communities. In an effort to protect these areas, A&S is using investigative data to prioritize the U.S. Government’s actions in appropriately addressing drinking water issues caused by DoD activities.

Going forward, the A&S organization will continue aligning itself to support the DoD’s top priorities. These projects, and many others, are critical pieces that fit together into the much larger goals of defending the country and arming the Warfighter.
Afghanistan Operations Reconstruction

10 Nonpolitical Takeaways for DoD Program Managers

Eugene A. Razzetti

CONGRESS CREATED THE SPECIAL INSPECTOR GENERAL FOR AFGHANISTAN RECONSTRUCTION (SIGAR) as an independent agency—not under any single department. SIGAR is the only inspector general focused specifically on the Afghanistan mission.

SIGAR’s final report, upon which this article is based in part, was comprehensively developed and professionally presented. Its eight chapters span the entire Afghanistan “experience” and should be a valued reference document for military and civilian professionals in the Department of Defense (DoD). Each chapter ends with “Key Findings” and “Recommendations.” The report identified, as it must, many issues of international foreign policy, NATO, global strategy and politics—all beyond the control of DoD program managers (PMs) and other acquisition professionals, and all beyond the scope of this article. However, the report identified issues that are within the control of DoD PMs and acquisition professionals, and provided actionable recommendations, and these are within the scope of this article.

Razzetti is a retired Navy captain, management consultant, ISO (International Organization for Standardization) auditor, and military analyst. He is the author of five management books, including Hardening by Auditing, a handbook for measurably and immediately improving the security management of any organization.
Chapter 4, “Equipping the Force,” and Chapter 5, “U.S. Based Training,” are the focus of this article and provide valuable program management instruction, independent of “politics.” That said, PMs and other acquisition professionals, knowing that they cannot change politics must, nonetheless, appreciate its existence, and be mindful of it as they execute their programs. Similarly, the Foreign Military Sales (FMS) Program is another area exerting an influence. FMS program execution is unique in Afghanistan. Referred to throughout the report as the “pseudo FMS” program, it does not follow traditional FMS procedures, which caused numerous issues in theater.

The good news is that your work is still “Program Management,” which, when robustly executed, results in a superior, mission-fulfilling product—whether that product is going to Afghanistan or Arkansas.

**Summary of Applicable I.G. Findings**

Table 1 covers (in greatly condensed fashion) some of the applicable findings of the report.

Does it look bad? You bet, but let’s be guided by a few thoughts. First, U.S.-based acquisition professionals must get involved in decision making earlier, ensuring that we’re providing the right products for the mission. Next, we must make those products as provably effective, robust, reliable and sustainable as possible. Next, we need to qualify (not just train) operators, leaders, advisors and logisticians the best that we can. Last, if we don’t do our jobs as best we can, the first one to know it will be that
young soldier standing out there in the sand. Let that sink in, and let’s get back to work.

**Equipping the Force**

Chapter 4 of the report, titled “Equipping the Force,” described the Afghan National Defense and Security Force, or “ANDSF” since 2002. Lack of consistency and direction took a heavy toll on equipping decisions—initially and throughout life cycles—and often lacked the involvement of all stakeholders. No further discussion of those decision-making processes is needed, except to sketch a more streamlined approach as shown in Figure 1 and described in the paragraphs that follow.

Note first the inputs in the boxes to the left. These boxes cover essential program management practices that, stated generally or specifically, were found lacking in-theater. The boxes are, for the most part, self-explanatory, except the top and bottom boxes. Training, as will be discussed later, must be in place, provably effective and focused on the right individuals and teams; and the overarching objective is the ultimate transfer of ownership to the forces in theater.

The boxes to the right are where “partnership” is molded in mutual respect and where preparation plus competence plus early/continuing involvement equal productivity.

This more accommodating decision-making process satisfies both DoD and FMS requirements, especially in how it includes partner nation involvement in the planning, execution, Continental United States or (CONUS) reach back, sustainability and configuration management, risk and threat definition/mitigation, development of Concepts of Operation, or “CONOPS,” and in the feedback loops.

The pseudo-FMS process increases roles and responsibilities for personnel in-theater, who are not as qualified as CONUS-based acquisition professionals, who (according to the report) are being “sidelined.”

**1 Mission Identification—Get Acquisition Experts Involved at the Beginning**

Mission identification and adherence posed a continuing challenge, often due to lack of communication between the United States and its partner nations. A mission, before it can hope to be accomplished successfully, must be appropriate, realistic, actionable, measurable and fully understood and concurred in by all participants. Anything less is unsafe and self-destructive.

Missions must be realistic sub-sets of a realistic “vision.” Then missions should be broken down into measurable goals, objectives and milestones. Otherwise, missions will be as specious and meaningless as “end world hunger” or “make the world safe for democracy.”

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**Table 1. Applicable I.G. Findings**

<table>
<thead>
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<tbody>
<tr>
<td>There is no comprehensive long-term plan to train, advise, assist and equip a partner nation’s military and security forces.</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Command and control suffer from a lack of long-term vision to transfer responsibility.</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>U.S.-NATO military and security plans require improved coordination among all stakeholders.</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>The foreign military sales process currently has no viable plan to transfer ownership and responsibility for recourses.</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>U.S. financing of partner nation security forces may be a continuing requirement even as their capabilities improve.</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Creating professional military advisors requires long-term assignments, proper incentives and skills development.</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Advisors should be selected based on technical expertise, proper training and vetting, and training focused on partner nation military structures, processes, culture and equipment.</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>U.S. military and civilian agencies cannot meet the high demand for advisors, and require special hiring authority to recruit/train advisors to fill advisor requirements.</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>The United States must determine the capabilities needed by partner nations to meet both long-term (ongoing) and short-term (specific) threats, and equip and train them for both.</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Failure to establish lead organizations results in inability to identify needs, fragmented command and control, and limited accountability and oversight.</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Tables and figures by the author.
Only after PMs and Warfighters, together with partner nation counterparts, have agreed on the missions, and on how (and with what) to execute them, can they move on to identify threats, risks and vulnerabilities.

1. Identify Threats, Risks and Vulnerabilities
   Threat Assessment is the practice of determining the credibility and seriousness of a potential threat, as well as the probability that the threat will become a reality. It consists of (first) identifying the threats, and then prioritizing them in order of danger level, and identifying mitigations or solutions. Identifying threats, weaknesses/vulnerabilities of own forces to the threats, and mission criticality is called risk assessment; and when courses of corrective action are explored, it becomes risk management.

2. Identify the Capability Gap—Partners, Not Customers
   The report states that the “pseudo-FMS” process does not compel the United States to seek “buy in” from the host/partner country. It is considered a best practice, but not mandatory, as it would be with traditional FMS. When carried to the extreme, partner nations end up with equipment that, according to the report, they “don’t want, don’t use, and didn’t ask for.” DoD can correct this when assessing the capability gap between the mission and the available assets. Figure 11 on Page 70 of the report compares FMS and pseudo-FMS processes.

   A capability is not simply a weapon or piece of equipment. It is a complex system of mutually reinforcing inputs that combine to enable military units to execute necessary functions in support of a mission. A capability gap may exist within an already existing system, or outside, where the risks, threats or vulnerabilities are yet to be assessed. Closing capability gaps requires that U.S. and partner forces work together, coalescing synergistically, producing outcomes exceeding those of the same forces working separately or when not cooperating. Partner forces must truly be thought of as partners—not hosts and definitely not customers.

   Material solutions (e.g.; improved sensors) or non-material solutions (e.g.; revisions to the CONOPS) can close capability gaps. Non-material solutions may close those gaps faster and sooner.

3. Configuration Enforcement—Give Everyone the Same Upgrade
   Configuration management is a critical subset of every acquisition program. It refers to systems
engineering processes that establish and maintain consistency of product performance. Configuration enforcement, however, ensures that functional and physical attributes remain consistent with design and operational requirements throughout the lifetime of the product. Configuration enforcement may be the single most useful tool in the configuration manager’s toolbox.

5 Connectivity—Don’t Leave Home Without It

Connectivity refers to a program’s or device’s ability to link with other programs or devices. A program that can import data from a wide variety of sources and can export data in many different formats is said to have “good connectivity,” especially when connecting to or communicating with another computer or computer system. The finest sub-systems are useless (or at least fall short) if they cannot effectively connect with each other and form a system. Connectivity in decision making means harnessing information from many information generators into one total picture—often called the Commander’s Dashboard.

The I.G. report was replete with illustrations of where connectivity was lacking or nonexistent—between systems, staffs and hemispheres. People were operating different systems, not coordinating and failing to implement a comprehensive total package approach. Activities were not “synced” to a common purpose. I.G. team members used the term “Powerless Middlemen” to describe inefficient or superfluous participants—unnecessary links in an overly slack supply chain. In-theater personnel reportedly resorted to “internet research” rather than using structured procedures to locate and procure needed supplies and replacement parts.

Connectivity with internal and external support sub-systems, and the corresponding systems of partner nations, must exist from the earliest developmental processes and throughout a product’s service life. In-theater forces should be able to connect with any resource—any time and any place.

6 Mission-Centric Foreign Military Sales and DoD Program Management

The DoD program facilitates sales of U.S. arms, defense equipment, defense services, and military training to foreign governments. The purchaser does not deal directly with the defense contractor. Instead, the Defense Security Cooperation Agency serves as an intermediary, usually handling procurement, logistics and delivery, and often providing product support, training, and infrastructure construction (such as hangars, runways, utilities, etc.).

The FMS stated goals include:
• Identification of requirements (item, quantity, delivery time)
• Initial support requirements (test equipment, power units)
• Operational concept (mission, number of bases, hours)
• Training (English language skills, maintenance, operations, supply)
• Configuration management
• Services (site survey, quality assurance, transportation)
• Follow-on support (spares, repair, pubs, ammo)

Again, we’re discussing traditional, not pseudo FMS.

While the FMS procurement, training, and support path may be different from normal DoD procedures, the “end product”—a working combat system capable of delivering measurable results when used by trained operators, looks the same to the engineer, builder and Warfighter. That’s especially true with a mission-centric approach. Figure 2 makes a mission-centric comparison of DoD and FMS program requirements. It also argues that sound DoD program management (including the continuing involvement/consultation of acquisition professionals) is critical to FMS process success.

7 Total Package Approach

The total package approach (TPA) ensures that items can be operated and maintained in the future and that FMS purchasers can obtain support
articles and services required to introduce and sustain equipment. It is a way to ensure that FMS customers are aware of and are given the opportunity to plan for and obtain needed support items, training and services from the U.S. Government contractors, or from within the foreign country’s resources that are required to introduce and operationally sustain major items of equipment or systems.

Table 2 describes how success in a DoD program’s management means success in FMS as well.

With all this in mind, we proceed to the next section.

Training—Train, Advise and Assist

Chapter 5 of the report is titled: “U.S. Based Training.” The report deals with training partner-nation personnel in the United States. Corrections to those shortcomings are beyond the scope of this article. The chapter makes a plea to DoD to train, advise and assist, in any way that it can to measurably mitigate or eliminate as many training shortcomings as possible—regardless of their sources or intended remedies.

Figure 3. Training Package Development

Figure 3 describes common areas of stateside training and qualification that lend themselves to in-theater training packages.

Many of the following in-theater training schemes for the common training and qualification shown in Figure 3 already are in use but could increase mission success significantly with modification and/or greater emphasis. Specifically:

- Establish/upgrade mobile training teams, covering the common areas shown in Figure 3.
- Conduct tabletop exercises for senior-level U.S. and partner Warfighters and logistics, walking the CONOPS through actual in-theater scenarios and revising it as necessary.

Table 2. Comparing Program Management Requirements and the Total Package Approach

<table>
<thead>
<tr>
<th>Requirement</th>
<th>DoD Program Management</th>
<th>Total Package Approach</th>
</tr>
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<tbody>
<tr>
<td>Mission planning; concept development</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Design/development (including hardware/software)</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Modeling/simulation</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Research and development</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Risk management plan</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Gap Analysis/needs assessment</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Core team developed; responsibility/accountability assigned (including decision makers)</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Warfighter/partner nation involvement</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Performance-oriented; metrics developed/consistent/actionable</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Test plans developed; tech yield identified</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Contract in place; executable</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Connectivity/feedback/CONUS (Contiguous United States) reachback</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Configuration/change management process defined/in place</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Internal/external security procedures in place</td>
<td>✓</td>
<td>✓</td>
</tr>
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</table>
Needs assessments improve the quality of policy or program decisions—thus leading to improvements in performance and mission accomplishment.

- Make the training “qualification-specific.” Establish the qualifications for specific positions (e.g., HUMVEE maintenance manager, CBRNE trainer/instructor).
- Conduct senior-level workshops in risk management, concept development, and measures of effectiveness. Risk management and concept validation build on a set of parameters established, initially, for trade-off studies of selected processes, products, or tactics. Participants must be proficient in these if they are ever to assume full responsibility and management.
- Train/qualify U.S. and partner personnel in tailored, streamlined, acquisition management and CONUS (Contiguous United States) reach-back procedures, to maximize connectivity and minimize time spent awaiting replacement parts.
- Develop focused checklists and flowcharts for critical procedures and inspections (e.g., site hardening, supply chain security management, tactical operations centers). A structured and comprehensive set of checklists can make its user an experienced inspector with its first use.

Add to all these a capabilities-based or qualification-based “mindset” that focuses on the ability of a person or process to get a job done.

Needs Assessment—Closing the Capability Gap

With missions, risks, threats and vulnerabilities established and prioritized as described earlier, the needs assessment follows. A needs assessment is a systematic process for determining and addressing needs, or “gaps” between current and desired conditions. The discrepancy between the current condition and wanted condition must be measured to appropriately identify the need in quantifiable terms and to identify a viable solution. The need can be a desire to improve current performance or to correct a deficiency in a system, organization or strategy.

Needs assessments improve the quality of policy or program decisions—thus leading to improvements in performance and mission accomplishment. Needs assessments guide decisions regarding design, implementation, and evaluation of projects and programs, as well as individual and team training and/or qualifications.

Metrics and Measures of Effectiveness

The report mentions repeatedly that training effectiveness was measured with great difficulty, when measured at all. DoD can look back on many years of effective data collection and analysis, and needs only to apply and share that knowledge with partner nations using such measures of effectiveness as (to list only a few):
- Number of qualified flight and maintenance crews
- Vehicle/aircraft up time
- Missions scheduled versus missions completed
- Number of sorties/flight hours
- Losses, personnel and equipment

Many years ago, I worked for an admiral who could take down the most confident readiness briefer with a simple question: “How did we prove that?”

Summary

If we can’t fix it, we can at least make it better.

The report of the special inspector general leaves acquisition professionals (first) with great respect and appreciation that such an endeavor could be done so professionally, leaving us with an invaluable reference document. Next, it leaves us with the assurance that the same problems and shortcomings doubtlessly will continue—and indefinitely, without prompt corrective action. Then it calls for action, applying acquisition expertise here and in theater, interjecting where/when necessary. Next, it provides a worklist that screams for attention and doesn’t care where that attention comes from—especially attention that says, “If we can’t fix it, we can at least make it better.” Next, it offers a comforting reassurance that we already have the management skills and need only to adapt and streamline them, empowering and involving acquisition experts where they are most needed. Finally, it leaves us with the discomforting knowledge that those young soldiers in-theater today (like my grand-nephew) can’t wait indefinitely for our help—and shouldn’t.


The author can be contacted at generazz@aol.com.
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“CRITICAL THINKING IS IMPORTANT.”
“Everyone needs to critically think to improve acquisition outcomes.”

Critical thinking has become a key aspect of the acquisition lexicon. The concept is touted as one of the crucial factors in obtaining positive acquisition results. I have been teaching critical thinking for more than 18 years, and I agree it is an important tool and can truly improve acquisition outcomes. But I fear it has acquired buzzword status. I believe that many people use the term without really understanding what is involved and how it truly is done. It is easy to say “I’m a critical thinker” and much harder to really do it. In fact, I believe it is harder to critically think in today’s acquisition environment than it has been in the past. I’ll explain the reasons for that later in the article.

A multitude of articles and authors are outlining and describing critical thinking in abstract and intellectual terms; the differences stem from an author’s desire to sell their books. Observations by these authors include Robert Ennis: “Reasonable reflective thinking aimed at deciding what to believe or what to do,” and Richard Paul: “Critical thinking is thinking about your thinking.” This article aims to consider several of the aspects, concepts and factors of critical thinking in basic, easy-to-understand terms.

Hahn is a professor of Financial Management at the Defense Acquisition University in Fort Belvoir, Virginia. She has worked in the Department of Defense and on Program Acquisition for 47 years and has taught critical thinking in both government and industry for more than 18 years. She is a Level III-certified acquisition professional in Program Management and Financial Management.
The NeuroLeadership Institute teaches “If you have a brain, you are biased,” which is why the core concept of critical thinking is questioning our biases. What facts or factors have clouded or predisposed my analysis? How are my past experiences limiting my perceptions? Am I considering the perspectives and objectives of other people or functional areas? Am I basing my decision on facts or on my intuition? What factors have I considered? Have I considered other options?

I believe that critical thinking has two sub-activities; creative thinking and analytical thinking. Most of us are very adept at analytical thinking, which is distilling vast amounts of information into the essential facts and then using those facts to make a decision or selection. Most people think analytically every day. It is part of our everyday decision processes. For example, when we purchase a car, we consider size, gas mileage, repair record, comfort, utility, suspension, drive train, and a multitude of other factors, including the exterior color and number of cup holders. We do this type of analysis without much ado.

We are much less comfortable with creative thinking. Creative thinking involves exploring new approaches and considering different alternatives while recognizing our predispositions. Understanding the relationship between the two thinking activities is important to appreciate their true value. Figure 1 illustrates the relationship between the two activities.

The solid lines indicate a typical process, where the obvious, standard alternatives are considered. The solution set will be reasonable and within normally expected parameters. But when creative thinking is applied in the early stages, the result is an increased number of options or alternatives, as shown by the dashed lines. Not only will you get more alternatives, but untypical, unconventional solutions may materialize providing the decision maker with a disparate array of alternatives. The expectation is that an increase in the number of alternatives coupled with a selection of unconventional alternatives will uncover a more effective solution. It should be noted that the unconventional alternatives inherently bring
some risk with them that should be considered in the decision-making process.

Consider the last time you were on a team in a brainstorming activity. The first 10 to 15 ideas put forward were standard, run-of-the-mill ideas—nothing special. After the “easy” ideas were exhausted, people started suggesting more imaginative and unusual thoughts. People probably started building on each other’s ideas. Perhaps the more imaginative, eccentric or even silly ideas might have sparked an innovative suggestion. Research has shown that is only after the “easy” or ordinary ideas are presented will the group start generating innovative ideas or solutions. When I’m facilitating a brainstorming session, I look forward to hearing the “silly” ideas, because I know the participants are starting to stretch their creativity. They are starting to knock down the boundaries that impede creativity. It is this creative aspect that propels us to consider pioneering, radical and perhaps even revolutionary options. Thus, creativity is a cornerstone of critical thinking.

That discussion might lead you to believe that creative thinking is most beneficial when determining the alternatives in the problem-solving process. Hmmmmm, I’m not sure if that is true. Creative thinking does indeed increase the number of alternatives considered. But let us consider where a creative activity followed by an analytical thinking process might enhance our decision making or outcomes. I’ve always believed that identifying the problem or defining the decision was the most critical aspect of the decision-making process. Without uncovering the source of the problem, it is easy to resolve a symptom and not the problem itself. Outcomes should be improved by using creative thinking to consider what “might be” the possible problem and then analyzing the assembled facts to ascertain the precise problem. Many people are familiar with the “Five Why” questioning technique to ascertain the root cause.

Figure 1. Relationship Between Thinking and Our Predispositions

Source of figures: The author.

It is a simple but fairly effective technique. You simply ask yourself “why did this happen?” After you determine the answer, you ask the question again. You continue to ask the question about the answer until you’ve reached the root cause. This is an example of using a common creative thinking tool to define the problem. Again, our biases can affect this process as well.

Figure 2 highlights the fact that I believe critical thinking, both creative and analytical thinking, can be used in every step of the decision-making process, thereby improving decisions and outcomes. In addition to using creative thinking to identify potential implementation approaches, a creative thinking tool can improve how a solution is implemented in force field analysis.

Force field analysis is a focused brainstorming activity. The decision maker or program team lists (brainstorms) all the factors favoring the implementation and all the forces hindering it. Then the team develops a plan to remove or reduce the hindering forces, and the implementation becomes easier.

Let’s get more focused on the components of critical thinking. Numerous articles and books expound on critical thinking models and approaches. I believe many share similar steps and components, I primarily have worked with Linda Elder and Richard W. Paul’s model in their 2001 book *Foundation of Critical Thinking*. Elder and Paul’s book discusses Intellectual Standards, Elements of Reasoning/Thought, and Critical Thinking Intellectual Traits. For article length considerations, I will focus my discussion only on their Elements of Reasoning/Thought; purpose, information, inferences, concepts, assumptions, implications and point of view.

First, purpose: What are you trying to accomplish? If the purpose of your thinking is to solve a problem, you will ask different questions than if you’re simply trying to comprehend a complex theory or situation. Your purpose will determine the types of questions you will ask and how they are asked. Obviously, the questions will determine what information or facts are gathered. The information gathered will influence the inferences or conclusions. The key concepts or ideas which are generated or considered will be directly related to the type information collected. The assumptions we make are based upon our biases and experiences and directly influence the inferences made. Our assumptions also may impact the questions we ask, and this indicates that they influence almost every element of reasoning. Our point of view also impacts most of the other elements; how many different points of view are there in this situation? Finally, the implications or long-term impact
of the decision should be considered. The secondary and tertiary impacts often are overlooked.

After just this short overview of the elements of thought, clearly conducting both creative and analytical thinking on each element can enhance our thinking and ultimately our decisions. Each element plays an important role in critical thinking. But I believe the two most influential elements are assumptions and point of view, because they are based on our personal experiences. The assumptions we make are undoubtedly influenced by our personal biases. Without a concerted effort to recognize the bases of our assumptions, they unconsciously will sway our decisions and possibly result in a less-than-ideal outcome. Our point of view tends to drive our focus on how the decision impacts us or our organization. It is imperative in using critical thinking to consider multiple points of view. It is crucial to identify how a decision impacts other stakeholders and the organization as a whole.

Earlier in the article, I mentioned that I believe that it is harder to critically think in the Department of Defense (DoD) acquisition environment today than it was years ago for two major reasons. First, in our understandable urgency about speeding delivery of our products and services to the point of need, we must still provide adequate if expedited time for planning so that we can secure the required quality. I understand clearly that the acquisition process needs to be responsive. I am very aware that our adversaries are innovative and that, to maintain our military supremacy, the acquisition process must quickly respond to changes in the threat. In emphasizing “faster,” always a dominant theme in times of conflict, let us say “faster and well thought out.” As Dwight Eisenhower said, “Planning is essential.”

Second, from my limited perspective, it seems that the military Services have adopted Frederick Taylor’s philosophy of workforce specialization. Each acquisition professional is “stove-piped” and becomes an expert in one acquisition area. With limited functional experience, the acquisition professional’s thinking becomes myopic and one-dimensional. Critical thinking requires multidimensional thinking. How can a person who has only experience or training in one functional area consider other perspectives and understand interrelationships? Many years ago, the different functional area courses at the Defense Acquisition University provided insight into the relationships between the various functional areas. As training days have been removed from courses, interdisciplinary lessons have been lost. Unfortunately, one-dimensional knowledge begets one-dimensional thinking.

I believe that both of these trends must be addressed if DoD leadership and the Congress truly want a more thoughtful, more agile, and more responsive acquisition process where critical thinking improves acquisition outcomes.

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**Figure 2. Using Critical Thinking Throughout Decision Making**
ODI 5000.02 DIRECTS THE USE OF SCIENTIFIC TEST AND ANALYSIS TECHNIQUES (STAT) TO DESIGN an effective and efficient test program for both developmental and operational testing. Unfortunately compliance with this guidance by simply checking the box (“We do STAT!”) provides no assurances that your testing and evaluation (T&E) program will receive the expected benefits in the following key areas:

- **Effectiveness**: the degree to which the testing process is successful in achieving the program’s test objectives (answers the right questions). This goal is the true bottom line of the testing process and one that the structured nature of the STAT process enhances.

- **Efficiency**: the degree to which the testing process is successful in minimizing the use of resources (uses the minimum necessary resources).

- **Defensibility**: the degree to which the analytical results of the testing process can be defended (verify the right question has been answered).

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Resilience: the degree to which the testing process can achieve the program’s test objectives in the face of unexpected changes in testing resources, factors, and conditions (readily adapts as needed to achieve test objectives in the face of testing uncertainty).

This article provides the STAT Center of Excellence (COE) perspective on what you really need to know to integrate STAT, as a process, into your T&E program to realize these benefits.

First, we look at the fundamentals you need to know about STAT to fully understand the rest of the paper. Second, we elaborate on various ways STAT can make a difference in your program by showing how integration of STAT into the testing process enhances its effectiveness, efficiency, defensibility and resilience. Third, we cover best practices for implementing STAT in your program so you can make the most of STAT. Finally, we provide you with a few questions to help you to evaluate how STAT benefits your T&E program and to figure out your next step in making the most of STAT.

What You Really Need to Know About STAT

Instead of offering a technical, abstract definition of STAT we offer a few concrete ideas to help you understand where STAT may fit into your T&E program.

Despite its use of the word “Techniques” the strength of STAT lies in seeing it as a deliberate process that uses a wide range of rigorous scientific techniques tailored to the T&E process at hand. This paper will use “STAT techniques” when we refer to the technical aspect of STAT, “STAT process” in emphasizing its process aspect, and STAT otherwise. Figure 1 illustrates how STAT is integrated into the T&E event-planning process.

The purpose of the STAT process is to support, not drive the testing process. The results of applying STAT techniques—such as efficient, effective test designs—are not intended to dictate testing decisions but provide information to support better testing decisions and consequently improve the decision quality and defensibility of
test results. Like any tool, STAT is not meant to be the tail wagging the dog.

DoD 5000.02 notes that scientific test and analysis techniques also includes Design of Experiments (DOE) methodologies. Although DOE is definitely a major STAT technique, it is only one of many scientific test and analysis techniques. STAT techniques are applicable to all kinds of T&E processes (Developmental, Operational, Integrated, Live Fire, Cyber) and to any scale of testing from laboratory bench testing to System of Systems testing. There are STAT techniques for handling both experiments (systematic manipulation of factors to determine their effect on responses) and non-experiments (correlations, surveys, interviews, observations, case studies).

Adoption of STAT by DoD acquisition organizations represents a significant change in culture from the “one-factor-at-a-time” or “we’ve-always-done-it-that-way” approaches to test design.

How STAT Can Make a Difference More Effective Testing

Methodically following the structured STAT process (Figure 1) is essential to the overall effectiveness of your T&E program. In particular, the STAT process focuses up front on developing a set of clear test objectives to drive the need for test resources throughout the testing process. Test objectives derived in this manner accurately reflect the goals of the program for the following reasons:

- Derived from the requirements
- Reflect the focus and purpose of testing
- Further define the scope of testing
- Specific, unbiased, measurable, and of practical consequence

A good test objective for a weapon system would be to characterize its end-to-end mission effectiveness over the operational envelope as opposed to focusing on simply verifying the set of threshold/objective requirements. This continuing focus on explicit test objectives, a hallmark of...
the STAT process, virtually guarantees a more effective testing process.

**More Efficient Use of Test Resources**
The sections below discuss how some of the STAT techniques and tools enhance the efficient use of scarce test resources. The last section highlights recent dollar savings from STAT-COE-supported programs due to more efficient use of test resources.

**Optimizing Test Designs**
A key efficiency of DOE is the use of software tools such as JMP to design an optimal set of test runs taking into account the large number of sources influencing the test design—factors, values of the factors (levels), allowed combinations of factor values, interaction between factors, maximum number of test runs, and specified level of confidence in test results, to name a few. Use of a tool like JMP will allow efficient trade-offs between the levels of confidence and coverage of all possible test sets. Furthermore, DOE can be used to screen factors, thereby removing needless factors.

**Efficient Sequential Testing**
Sometimes it is more efficient to first execute a small run of carefully designed test points to collect information about the response variable at selected points in the factor space instead of running a single large set of points. The points in the next set of runs in the sequence would be chosen based on the results from the previous sequence. This deliberate exploration of test points in the test space enables a very efficient test strategy.

**Using Combinatorial Optimization (CO) Tools**
Consider the need to test complex application screens with:
- A large number of different fields (inputs) in a screen
- Multiple possible values associated with each field
- Many possible test cases required to exhaustively test a screen

STAT tools like the National Institute of Standards and Technology’s (NIST) Automated Combinatorial Testing for Software (ACTS) can be used to select sets of test runs that allow test resource managers to optimally tradeoff the number of test runs against the coverage of combinations of factors.

**Quantified Resource Impacts of STAT**
Table 1 displays documented dollar savings for some of the acquisition programs supported by the STAT COE in 2018.

**More Defensible Results**
The final output of the test process, the analytical results that support the decision maker, are more defensible because they are built on the rigor invested in applying STAT across the test planning, design, execution, and analysis phases. Rigor in the test process can be assessed by the way each key component in each phase is handled—its accuracy, exactness, exhaustiveness, meticulousness, and precision. For example, rigor in the planning phase might mean that STAT-related requirements are clear and unambiguous, are quantifiable, and can be accurately measured.

**More Resilient Test Designs**
Even the most carefully formulated test designs are likely to face a slew of uncertainties before being executed. Potential problems include:
- Immediate gain or loss of test resources
  - Funding (more/less test cases)
  - Test assets (more/less)
  - Instrumentation (change in measurement accuracy)
  - Test range availability (more/less time)
  - Test results data (response/factor values)
- Uncontrollable changes in testing conditions
  - Inability to control value of factor from one test case to another as expected
  - Tests that cannot be executed in the originally planned order

STAT experts working closely with key T&E personnel (Chief Developmental Tester, T&E Manager) can typically provide a complete redesign of the remaining tests consistent with the program’s current testing objectives in a matter of hours (or even minutes) instead of days.

**STAT Implementation Best Practices**
We need to examine best practices for implementing STAT in the areas of people, training, integration, and external support.

**People**
The most important attribute of the people involved in applying STAT is their willingness to pro-actively learn and implement STAT and to gain a working knowledge of the

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**Table 1. Documented Savings from Application of STAT**

<table>
<thead>
<tr>
<th>Service</th>
<th>Program</th>
<th>Savings to Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Navy</td>
<td>Littoral Combat Ship</td>
<td>$27.7M</td>
</tr>
<tr>
<td>Army</td>
<td>Common Infrared Countermeasures</td>
<td>$2.8M</td>
</tr>
<tr>
<td>Air Force</td>
<td>Joint Strike Fighter (JSF)</td>
<td>$1.2M</td>
</tr>
<tr>
<td>Navy</td>
<td>Next Generation Jammer</td>
<td>$980K</td>
</tr>
<tr>
<td>Air Force</td>
<td>Combat Rescue Helicopter</td>
<td>$420K</td>
</tr>
</tbody>
</table>

Key: K = thousands; M = millions of dollars.  
Source: STAT COE.
STAT process instead of waiting until it is needed. STAT techniques continue to grow and evolve over time; if people do not keep their STAT knowledge and skills up to date, their effectiveness in tackling the growing challenges of applying STAT to the increasingly complex T&E process will diminish. Thus, the people providing STAT support to your program should ultimately be full-time STAT experts.

Training
From two major perspectives, training is essential to facilitating the desired change to organizational culture. Key acquisition program personnel and the entire T&E team, at a minimum, need to understand the fundamental STAT concepts that will be employed. Frequently the best way to accomplish this training is to have the STAT support team develop and present “STAT 101” training. The second perspective involves specialized training to fill a specific need, such as a briefing to the test execution team to ensure critical aspects of the test methodology are followed. Additionally, senior leader STAT training may be required.

Integration
The STAT COE’s experience has shown that STAT can make the most difference when the STAT experts are fully integrated into your T&E program. They need to know what’s going on in the program and be invited to participate at all relevant meetings. STAT experts should routinely be part of the discussions about what the requirements mean and how to ensure that program performance is correctly assessed. Ensuring two-way communication with STAT support provides more opportunities for any lingering questions to be answered and increases the chances of a mutual understanding of what needs to be done when changes of direction occur. Working collaboratively with your STAT experts will help them gain a better understanding of program requirements and consequently aid them in helping to develop a rigorous test plan that most effectively covers the entire design space while remaining within budget. When STAT support is viewed and treated as an integral part of your team, it’s remarkable how seemingly intractable test design problems are easily handled.

Early integration of STAT into the program increases the likelihood of better formulation of performance requirements and earlier identification of significant test factors. Rigorously testing performance requirements frequently demands precise formulation. For example, the STAT COE supports a Defense Business System program that had numerous pass/fail user response time requirements already cast in concrete when we engaged the program. Such a rigid requirement formulation does not provide a way to quantify the risk of failure as does a requirement that explicitly captures the expected uncertainty. If we had been engaged with the program during the requirements generation stage, we would have had the opportunity to recommend that the program consider formulating requirements that explicitly take into account risk, such as 95 percent of all response times must be less than 5 seconds.

Programs sometimes need to accurately predict the number of expensive, long lead test resources that will be required early in the program where there is little past experience to guide the decisions. In this situation, savvy STAT experts know how to make the best use of existing test data to design an efficient, effective test program that can be quickly updated as additional test data becomes available.

An important, yet often overlooked, aspect of integrating STAT into your program is ensuring the contracts of your prime contractor and/or system implementer require them to employ STAT in their own testing activities as well as to support STAT tasks as needed in government testing. Consequently, STAT-related tasks need to be incorporated into the Statement of Work/Performance Work Statement and related contractual documents.

External Support
The primary source available to you for external support is the STAT COE. This center has gained extensive experience providing direct support to a wide variety of DoD acquisition programs. Program managers can request STAT COE support by calling (937) 255-3636 x4736 or via the email address below. To learn more about the STAT COE and its resources (Short Courses, Best Practices, Tools, Test Planning Guides, Tools, Newsletter, Ask a STAT) go to https://www.AFIT.edu/STAT. We have found that STAT-trained individuals who have been mentored under the supervision of a STAT COE expert while supporting a T&E program also provide excellent STAT support.

Make the Most of STAT
If you can answer “Yes” to the questions below without blinking an eye, congratulations! Your program is making the most of STAT and we at the STAT COE would appreciate your sharing with us what is working for you.

• Do you believe that your testing process answers the right questions?
• Are you getting the most out of your test resources?
• Do you believe that the rigor of your process ensures that the right question has been answered?
• Can your T&E program quickly adjust your test designs to changes in test resources and testing conditions?

If, on the other hand, you are not satisfied with what STAT is doing for your program or need to learn more, reach out to the STAT COE for help (email: COE@AFIT.edu).

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DAU has partnered with Coursera to provide over 3,000 online courses from major universities to help DoD acquisition organizations upskill their workforce.

Specializations in Agile Software Development, Machine Learning and Data Analytics are available now and additional programs can be tailored for acquisition organizations.

Acquisition organizations should contact david.pearson@dau.edu for details.
ADAPTIVE ACQUISITION: A Cure for Contract Inertia

Edgar Quiñones, DBA
B. Andrew Cudmore, Ph.D.

Change is required to be efficient, effective and proactive in today’s fast-paced and rapidly changing world. Dr. Kurt Lewin’s Change Theory offers a model for change. This model suggests three steps in change management: unfreeze (preparing for the desired change), change (implementing the desired change), and refreeze (solidifying the desired change).

Change often is resisted, and the result may be inertia (remaining unchanged). “That’s just the way we’ve always done it” is a common response that implies a resistance to change. Resistance to change can occur at both the individual (e.g., fear, new learning or disruptions of stable relationships) and the organizational level (e.g., threat to power structure, system relationship, sunk costs, vested interests or inertia of organizational structure). Correspondingly, there are internal (e.g., new technology, changing work values, creating new knowledge or product obsolescence) and environmental forces for change (e.g., competition activities, changes in consumer demands, resource availability, social and political change, or international change).

The question then becomes how to facilitate change given resistance. Lewin’s model suggests that the need for change must be determined, support ensured, resistance managed and understood and its importance recognized. In commercial markets, customers increasingly are demanding faster transactions, establishing focus for business operations, in terms of reaching customer needs faster and with more flexibility. From Amazon’s one-day shipping to Little Caesar’s grab-and-go pizzas, both capitalize on speed to meet consumer demands.

Within the military, the need for rapid acquisition is increasingly pertinent; however, transactions for defense equipment and services often are not facilitated as rapidly as in the commercial sector. The current acquisition process is much more complex and requires much more coordination between the two parties (government and the contractor) and therefore ultimately require more time. However, the current acquisition system allows for programs to tailor their acquisition strategies, based on the needs and the priorities of their respective programs. Such options include (as laid out in the Defense Acquisition University [DAU] Contracting Cone) Other Transaction Authorities (OTAs), Procurement for Experiments, and Research and Development (R&D) Agreements. Therefore, examining these options, and what current programs have employed these options, will provide the
best opportunity to streamline the acquisition process and avoid contract inertia.

**Past and Current State of Affairs**

Over the last 18 years, the United States has engaged in the War on Terror with adversaries that have had deficient technical capabilities. However, according to the 2018 National Defense Strategy (NDS), present peer state adversaries, such as China and Russia, are beginning to boost their military capabilities and close their gap with U.S. military supremacy. The NDS further calls on the need for innovation, speed and agility to combat these new threats. As opposed to the War on Terror, direct war with a peer-state adversary would require a revamped acquisition process. Prevention of such a war should be the focus of U.S. policy.

The best prevention based on the NDS is deterrence. Such deterrence could come in the form of acquisition agility. The 2018 National Defense Authorization Act calls for increased acquisition agility, as well as the intent of producing rapid capabilities for the U.S. military. Maintaining and improving these capabilities would be a viable and efficient way to deter such emerging threats. It is not enough to simply have the military hardware and services available for production; rather, it is essential to rapidly acquire and deploy these capabilities to the field, or as needs demand. Therefore, the speed of production, while necessary, depends on the transaction speed as dictated by the contracting and acquisition process. But what if this process could be improved?

**Contract Inertia**

Becoming faster and more agile requires change. One barrier to change is “contract inertia”: comfort in a standardized transactional process and an unwillingness to change such a process, even if the result is more streamlined. Education can reduce this barrier. Sometimes inertia occurs as the participants have failed to recognize that the environment has changed, and that the present system, and its requirements, or assumptions, may also have changed. For example, consider the QWERTY system used on modern keyboards; this system was originally designed in the age of mechanical typewriters to slow typing, in order to avoid the jamming of the metal keys. With modern keyboards, there no longer is a need to slow down the typing and yet the system persists. Arguably, this resistance could be rooted in complacency, comfort or resistance to change, and yet its present users also may not know of the basic rationale for the original system, which has been largely forgotten over time. Thus, part of the impetus for change lies in understanding why there could be resistance. This resistance could be rooted in fear, risk aversion, control, perceived inefficiencies, process ownership, and commitment to past actions, to name a few motivations.

In any case, communicating, disseminating and learning are essential components to facilitating change. Therefore, within government contracting, while current systems such as the Federal Acquisition Regulation (FAR) and Defense Federal Acquisition Regulation Supplement (DFARS) are put in place for most standard programs, in times of need and rapid innovation, flexible options should be explored and considered.

**Flexibility in Defense Contracting**

Within the FAR, flexibility in contracting is allowed for both the government and contractors on a case-by-case basis. As mentioned, even outside the FAR within defense contracting, there are alternative options such as OTAs, Procurement for Experiments, and R&D Agreements. The options are in place; we need to ask, “When should these options be deployed and what are the pros and cons of such utilization?” The FAR and its supplements obviously were put in place for a reason. Doing away with these standards entirely would not be advisable. Making significant changes also will not be a near-term option, due to the time needed to implement the changes, have the changes flow down, and for the industry adapt to these modifications. Instead, adaptive approaches based on case-by-case program requirements should continue to be utilized.

Every defense program is different, each with varied priorities and complexities. Thus, it would be overly simplistic to assume that flexibility in contracting can apply in the same way to all programs. Doubtless, some contracting methods, such as the standard FAR/DFARS regulations, are in place to facilitate a standardized approach
applicable for most defense programs. However, OTAs or R&D Agreements are options that should be considered more openly to ensure that there is a more flexible contracting approach.

The New Deterrence: Rapid Deployment and Agility

In military-based Deterrence Theory, there is concept of having an advanced weapon capability with no intention of using it except as a last resort. The premise of this theory is that the fear of retaliation prevents aggression on the part of adversary powers. This Mutually Assured Destruction (MAD) policy has worked in the past Cold War between the United States and the Soviet Union.

Today, this threat is given more weight depending on the possible speed with which a response can be made. The ability to field new military capabilities and have adequate services available as rapidly as possible facilitates deterrence. Of course, R&D of such defense technology will make up the bulk of the turnaround time for deployment, there will be an equally important transaction time through the appropriate requests for proposals to received proposals, to contract award, and then to follow-on contracts. Contractual arrangements between the government and the contractor pave the way for deploying hardware and services. Therefore, a focus on speed and flexibility in acquisition is a necessity in deterring emerging threats to both the United States and its allies.

Path Forward

Following Lewin’s model, change requires communication, clarification, empowerment and involvement in the process. Current acquisition needs to be cognizant of peer-state adversaries and prepare for new domains of future conflict. For example, the Department of Defense has prioritized hypersonic technology, given the clear advances in this technology by Russia and China. Director James Faist of the Defense Research and Engineering for Advanced Capabilities argued that OTAs, in this case, could avoid the obstacles of traditional contracting, “The intent is to get rid of the contractual … valley of death.” That valley is any hindrance to acquisition speed and agility.

At present, there is no one size fits all approach, but proper planning for future needs is a necessity. This requires an ongoing situation analysis—meaning intelligence gathering, in terms of the present system, its assumptions, its requirements, and where there are opportunities for a competitive advantage, which in turn provide opportunity for deterrence.

If rapid deployment and agility are viable to deterrence, then one competitive advantage would be innovativeness in the process of change itself. As suggested by the strategy advisor, Ross Dawson, such innovation governance would center on a unified vision. This vision would prioritize innovation objectives and would reveal how innovation contributes to future success. Of course, to manage risk, an organizations’ risk-to-reward tolerance must be clarified, prior to the development of management team capabilities and establishment of organizational structures and processes. Finally, success hinges on extensive dissemination of this overall innovative vision, within the boundaries of established risk tolerance. However, fundamental to innovation (a form of change) is the understanding of the compelling reason for change, as outlined by this article—essentially, an inability to adapt (inertia and complacency) could be considered a national security risk.

Such risk is not deterred solely by awareness but also by the ability to proactively act when there is a threat (e.g., cyber-terrorism, a significant threat to the United States), for which until now there has been little preparation. As it stands, however, the government does have options at its disposal, but these options need to be utilized on a proactive as opposed to a reactive basis. Being efficient and agile are parts of being proactive.

Peer adversaries are moving faster than ever in defense. In order for the United States to maintain its military superiority, it must be adaptive, not only in the production process but also in the transactional process through its contracting methodology. Thus, contract inertia or inertia of any kind that hinders innovation and puts U.S. defense advancement at risk could be a significant national security risk that requires resolution.

It is necessary to move a change plan forward to complete the third step in Lewin’s model. Consistent with this but providing further guidance from common elements across other change models, is a framework offered by the University of Virginia. This involves communications, engagement, training, support, metrics and transition sustainment. More specifically, this plan depends on defining the need, the change, assessing the environment and, finally, the impact on the three types of change (people, process/structure and technology). To succeed, two-way communication and engagement are needed to explain the “why” and the desired outcomes, while understanding and developing the human resources and embedding change into systems, processes, and policies (anchoring the changes in the culture). This change will require reinforcement, measurement, continuous improvement, and the celebration of successes, in order to battle contract inertia and maintain competitiveness in deterrence and security risks to the United States and its allies.

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A Portfolio Management-Based Acquisition Model?

Brian Schultz

At 20 a man is full of fight and hope. He wants to reform the world. When he is 70 he still wants to reform the world, but he knows he can’t.
—Comedian Rodney Dangerfield

DEFENSE ACQUISITION DEFINES success based on cost, schedule and performance (c/s/p) goals as part of a program-centric model. Program managers (PMs) commit to achieving these c/s/p parameters when they sign the acquisition program baseline, similar to a management “contract” with the program executive officer and the milestone decision authority. This program-centric paradigm has been in place for decades and drives the behaviors in all aspects of defense.
acquisition, including requirements, funding, policy and acquisition decisions.

Is this still the right model in today’s environment? Are we investing in the right things and reacting fast enough to change? The short answer is no and it is imperative that we change to a portfolio-based acquisition model! As part of this change, we also should define what success looks like and how to measure it.

Before examining this portfolio management model, we should review some background. Efforts to reform acquisition have continued for the last several decades with numerous studies, panels, boards and legislative actions. Despite the many criticisms and attempts at reform, the defense acquisition system has delivered technologically superior weapon systems since the end of the Vietnam War. Our defense systems capabilities were a key factor in the successful conclusion of the Cold War in the early 1990s. Weapons superiority deters adversaries and enables war-winning capabilities when deterrence fails.

Attempts to measure the overall performance of the defense acquisition system concluded that performance in terms of c/s/p was improving based on the annual Performance of the Defense Acquisition System reports from 2013 to 2016. The 2016 report stated the 5-year moving average of cost growth on our largest and highest-risk programs was at a 30-year low. While this appears to be great news, the 2016 report also highlights how the primary outcome of defense acquisition is the value of operational capabilities. The report goes on to explain how it is difficult to measure value to the Warfighter so the focus of the study defaults back to the more easily quantified measures of c/s/p.

Recently, senior leaders have expressed concerns about our eroding technological edge. The costs of decades of Middle East conflict have limited our ability to recapitalize aging fleets and develop new systems. Meanwhile, our near-peer competitors have been investing in new capabilities and deploying new systems without the burden of prolonged conflicts and global operations. Moreover, the availability of commercial-based technology and intellectual property theft have enabled new and emergent threats. The consensus is that, in support of our new national security priorities and major power competition, defense acquisition must go faster and deliver warfighting capability with greater value. In order to achieve faster cycle times and deliver better outcomes, some observers, including the Section 809 Panel on DoD market-based adaptability, have recommended a major acquisition reform known as portfolio management.

Portfolio management is a strategic management process that starts with an enterprise-level identification of needs and opportunities. These needs, or capability gaps for the Department of Defense (DoD), are then prioritized based on urgency and funding and other constraints. When a prioritized list is available, portfolio managers develop business cases for alternative product ideas to exploit each of the highest priority needs and/or opportunities. Each alternative product proposal gets a thorough review via a gated process. At each successive gate review, managers review product proposals against others in the portfolio, weighing them against resources, criteria and the objectives of the enterprise. As alternatives pass through the gate reviews, only those proposals with the highest potential to succeed and pay off make the cut into the overall portfolio. Thus, portfolio management shifts the paradigm from optimizing individual programs to optimizing a portfolio of investments that show the greatest value in meeting enterprise objectives.

The concept of portfolio management is not new to DoD, but it is not fully integrated across the DoD acquisition decision support systems. The Government Accountability Office’s Report 07-388 in 2007 highlighted the differences between industry and DoD investment decision making. The report also recommended that the DoD adopt several of the commercial best practices for portfolio management. The DoD agreed with the majority of the recommendations and identified several pilot initiatives undertaken to address them. The GAO report also mentioned how the “[military S]ervices fight together as a joint force but separately identify investment needs and allocate resources using fragmented processes that do not support an integrated, portfolio management approach.” More recently, GAO Report GAO-15-466 in 2015, continued to recommend a stronger portfolio management model. DoD partially concurred with the recommendations but took issue with the suggested implementation steps. Finally, the
The change is so dramatic that the risk of severe and unintended consequences is significant enough to warrant some baby steps before a wider implementation.

Section 809 Panel report, January 2019, identified portfolio management as a priority for reform, recommending not only a change in investment processes but a shift away from the decades-old program-centric acquisition model.

The Section 809 Panel report recommended that the portfolio management approach include a new organizational construct for requirements, funding and acquisition management responsibilities. The report provided significant content on how to implement this new model, which may seem like a radical reform for some, given its wide-ranging ramifications to an entrenched bureaucracy.

We should recognize that the Joint Capabilities Integration Development System (JCIDS) process for requirements attempts to use some elements of portfolio management across Functional Capability Boards in broad mission areas. We also see portfolio management used in the information technology domain. However, implementing this broader change across acquisition decision support systems (requirements, funding and acquisition) would arguably constitute the most significant acquisition reform ever attempted. The change is so dramatic that the risk of severe and unintended consequences is significant enough to warrant some baby steps before a wider implementation.

The portfolio model change would also require significant legislative authorizations, which might be difficult to sell to Congress. Thus, the 809 Panel recommended establishment of a pilot program in each military Service that would take responsibility for a portfolio of programs.

Piloting portfolio management within one Service does not fit well with the overall concept. If we link portfolio management to mission capabilities, then a better pilot program approach would be one that includes appropriate Joint Service participation. This would enable the portfolio manager to optimize a set of capabilities for mission effectiveness, as opposed to optimizing individual Service program portfolios.

The Section 809 Report suggests establishing a smaller, less visible portfolio manager for requirements, funding and acquisition decisions within the assigned pilot portfolio. Appropriate legislative action will be crucial because current funding statutes and rules constrain the movement of funding from one program to another. These funding rules are a significant obstacle to implementing a portfolio based model since rapid resource shifts will be necessary in order to optimize the assigned portfolio and exploit opportunities.

Without this expanded authority to shift funding and priorities, portfolio management cannot work in today’s dynamic environment. These funding shifts, also known as reprogramming actions, are among several constraints related to fiscal law and regulations that must be reviewed as well as changes to support a real portfolio management model. The 809 Report addresses other details, including new organizational structures, proposed congressional language and new decision processes. However, one area in the report that lacked much discussion involves defining and measuring portfolio-management success.

Earlier, we touched on the c/s/p metrics that gauge success. There are three fundamental issues regarding continued use of c/s/p in a program-centric model. First, c/s/p metrics do not allow investment managers to optimize a portfolio of investments that contribute to mission capabilities. Optimizing individual programs for c/s/p can be detrimental to the larger mission portfolio, which may require a rapid shift in resources at the expense of the individual program. Secondly, and as mentioned before, c/s/p metrics do not provide insight into the value the program delivers to operators. A program could meet all of its c/s/p metrics but provide little or negative value, based on changing requirements. Finally, c/s/p metrics do not support rapid shifts in acquisition because the system incentivizes continued and stable funding and avoids new requirements to avoid a baseline breach. The acquisition program baseline is one of the fundamental management tools in program-centric acquisition, locking down requirements, cost estimates, and schedule dates. PMs must report breaches up the chain, even to Congress in some cases when significant or critical deviations occur. These breaches often indicate poor management performance or technical problems that could put future funding for the program at risk.

Adopting portfolio management can help overcome these issues, but the magnitude of the change will be dramatic. It also will involve a cultural change since leadership would need to adopt new metrics and incentives.

So if c/s/p goes away, what measures replace them? The measures we choose obviously are very important as indicated by the quote “what gets measured gets done” (attributed to many sources). Establishing the right metrics will drive the right behaviors but will also help decision makers determine adjustments and investment priorities. Measures of success that focus on outputs (e.g., c/s/p) may indicate some level of efficiency but not the value...
provided. For defense acquisition, the default measure should start with the value of operational capabilities delivered. Thus, the measure of success for portfolio performance should be value metrics in support of operational mission improvements. The good news is that we now have the tools and technology to make it happen.

Mission engineering, joint simulations, virtual operations and digital engineering are examples of tools that can enable greater insights into the value of acquisition deliverables. Mission engineering, also addressed in the Section 809 Panel report, provides an integrated view of missions and supporting capabilities that can enlighten acquisition decisions within an operational context. An enterprise-mission architecture can provide the foundation for future solution architectures and fielded capabilities. The DoD also has adopted a digital engineering strategy that will formalize the development, integration and use of models to inform enterprise and program decision making. These models can help future portfolio managers look beyond individual systems and Service-specific portfolios for broader mission capability and mission gap assessments, ultimately leading to delivery of capabilities that provide greater operational value. Figure 1 provides a summary of the paradigm shift from the current acquisition model to portfolio management.

In order for mission engineering and other tools to support the portfolio approach, the requirements and acquisition communities must collaborate and work in a more integrated manner. Acquisition expertise provides the technical, engineering and business know how while the requirements managers provide the mission expertise. We might even consider integrating two communities into the new portfolio-management structure. Rather than focus on specific program requirements, portfolio managers will develop capability solutions that fill gaps in mission scenarios. This mission enterprise view across system and mission domains can enable portfolio managers to minimize or eliminate redundancies and low-value efforts.

The software development community provides interesting insights on value-based metrics. Organizations that use agile software development and deliver software to users in short, consistent cycles are dropping the program-centric approach. While there are several variations of agile methods, one of the common threads is discovery of the biggest pain (or value) points. Addressing the big pain points can provide users with the greatest benefit so that they receive the highest priority and team focus, putting other needs in backlog for future consideration. Portfolio management can enable identification of mission pain points through multiple tools and activities, including robust mission engineering.

Programs that employ DevSecOps for software also measure performance with both efficiency and outcome-based measures. Efficiency measures include software deployment frequency, deployment speed, backlog velocity, mean time to recover, cyber intrusion detection and prevention rates—to name a few. Efficiency measures provide useful insights but leaders should ensure their use in conjunction with value-based metrics. Otherwise, we might incentivize teams to become efficient but lose sight of the results produced by that efficiency. Examples of outcome-based metrics include customer satisfaction, user acceptance or reject rate, user productivity improvements, mission effectiveness enhancements, and many others that relate to value and return on investment. Examples of metrics associated with rapid prototyping might include time to deliver early knowledge points, cycle time to build virtual prototypes, number of failures and lessons learned, and time to mature prototypes into field-able capabilities.

**Final Thoughts**

Some of us who have been working in acquisition for decades can relate to Dangerfield’s quote about the frequent inability to bring about change. There is, however, renewed optimism that change is not only possible but is beginning to occur. Even some of us old-timers are excited about the possibilities and opportunities. The DoD acquisition community has demonstrated great proficiency at optimizing programs and we can be even better at optimizing portfolios. The time is ripe for a portfolio-management acquisition model. Let’s get the pilot effort rolling!

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The author can be reached at brian.schultz@dau.edu.

![Figure 1. Paradigm Shift](source_of_figure: The author.)

<table>
<thead>
<tr>
<th>Current</th>
<th>Future</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program-Centric Acquisition</td>
<td>Portfolio-Management Acquisition</td>
</tr>
<tr>
<td>Cost, schedule, &amp; performance metrics</td>
<td>Return on mission effectiveness metrics</td>
</tr>
<tr>
<td>Stable and complete requirements</td>
<td>Welcome changing and new requirements</td>
</tr>
<tr>
<td>Optimize individual program</td>
<td>Optimize mission capabilities</td>
</tr>
<tr>
<td>Long development &amp; fielding cycles</td>
<td>Rapid fielding of mission capabilities</td>
</tr>
<tr>
<td>Lock-in funding and schedule</td>
<td>Shift resources to exploit new opportunities</td>
</tr>
<tr>
<td>Fragmented processes and stovepipes</td>
<td>Enterprise architectures across mission domains</td>
</tr>
<tr>
<td>Monolithic Kill Chains</td>
<td>Adaptive and unified kill networks</td>
</tr>
</tbody>
</table>

Source of figure: The author.
Reducing Barriers to Workforce Innovation

Robert Frum

Measurable processes for fostering inventive thinking are needed to get things done. The origin of innovation, from the Latin *innovationem*—in novo—is to renew, essentially the action taken to fix or replace something. A contemporary definition by computer scientist and author Peter J. Denning has said that “innovation is the adoption of a new practice in a community.”

Innovation requires that people, as change agents, accept or reject the modification. Indifference or resistance to change may stifle innovation without explicit leadership intervention. Just as an organization applies risk management techniques to minimize potential negative consequences, so, too, an organizational framework is needed to maximize potential positive change. Without a supportive structure and assessment measure, leaders can only intuitively infer their organizations’ commitment or impediment to innovation. An innovation index indicates an organization’s culture for encouraging, evaluating, processing and approving ideas for new or improved business products, services, processes and programs.

Innovation, typically associated with advances in technology, has become the new normal in the business community. Commercial businesses operate in a highly competitive market environment that rewards good product and service differentiation with consumer revenue. Commercial businesses in a competitive market embrace innovation to improve efficiency and productivity by lowering production costs and to create new, better and less expensive products for consumers.

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Governmental organizations also have customers but, by contrast, exist to serve the public and do not compete for profit. Generally, government agency missions are oriented toward accomplishing national laws and policies through administrative processes and regulatory compliance. Within the federal public sector, the innovation imperative may stem from national interests competing with other countries in areas such as defense security, energy sufficiency and food independence. To address these strategic challenges the Congressional Budget Office in 2014 reported: “The federal government influences innovation through two broad channels: spending and tax policies, and the legal and regulatory systems.” Federal laboratories, programs and grants support foundational research and development of new technologies at the frontiers of science and engineering. Federal agencies also provide public services directly to citizens, businesses and other organizations, in which the customer experience is becoming more demanding in the digital era of e-government.

Both commercial and government enterprises have goals of improving safety, responsiveness, satisfaction, efficiency, productivity, effectiveness and cost savings. The difference is the translation from goals to implementation—the desire and the ability to remain agile to allow adaptive changes necessary to improve the business model and customer service in the Information Age. Organizations that desire to remain viable encourage innovation. Implementing new and potentially disruptive practices requires leadership approval of the vision, tolerance for initiative uncertainty and commitment to transformation. The leader establishes the organizational culture that embraces the opportunity for innovation and calculated risk taking, while the line of business directors encourage commitment and facilitate change, as noted in 2012 by Harvard Business School Professor John Kotter. Leaders place great confidence in managers to oversee the day-to-day business and trust their judgement. As noted in a Prosci Change Management report, “...engagement with and support from middle management as a top contributor to change management success. In a separate study with 575 change leaders, 84 percent of participants ranked manager and supervisor involvement in change initiatives as ‘extremely important’ or ‘very important’ to the success of their project.”

Innovation Intervention
There are two fundamental reasons why there is so little actual innovation within organizations: (1) implementing innovation is not easy, and (2) an innovation environment is not an imperative. The former reason is a challenge as the path from good idea to successful process replacement is risky, demanding and barrier-prone. The latter reason is attributable to whether leaders and managers foster an innovative culture, which is a prerequisite for innovation opportunity. The challenge is not identifying and executing innovative concepts, but failing to overcome the inertia that status quo is good enough. Lack of innovation is found in organizations with passive/defensive cultures identified with behavioral characteristics including conformity, rigidity, lack of team member accountability and initiative, interaction that will not threaten their security, and with “fit in and meet expectations.” Employees adjust to whether organizational culture is receptive to thinking outside the box or just fulfilling the daily requirements.

Konosuke Matsushita recognized the significance of an innovative and creative workplace environment. Matsushita, an orphan raised in poverty, was an entrepreneur who started a business with three employees and about $50, based on an electric light socket he designed. Last year, Matsushita’s Panasonic Corp. employed about 330,000 people in 580 subsidiary companies with revenue of approximately $74.5 billion. Matsushita stated, “You [U.S. businesses] firmly believe that sound management means executives on one side and workers on the other, on one side men who think and on the other side men who can only work. For you, management is the art of smoothly transferring the executives’ ideas to the workers’ hands.” Matsushita relied on his employees for innovation, instilling a culture in which employee proposals receive impartial management evaluation and leadership adjudication.

Innovation Process
Managers are particularly important to innovation effectiveness in their intermediary role between senior leaders and employees, and their administration of the people who work for them. Managers receive ideas, consider merit and determine whether to continue developing the proposals. The management staff responsible for executing daily operations are the stakeholders whose buy-in is key to
move an idea from concept to implementation. Every organization experiences internal competition for influence and resources to attain success. Innovation represents change, with the intention of improving or replacing certain processes. Change may be disruptive, perhaps with actual or perceived winners and losers. Managers especially have a stake in the outcome, not the least of which is that they risk having a failure that could affect their careers.

As stated by Bruce D. Fischer and Matthew Rohde in a 2013 article in the American Journal of Management: “Resistance to innovation by management generally occurs in two ways. It may be in the resistance to ideas and their approval, or it may be through resistance to the implementation of approved ideas. Resistance to the introduction of ideas may not be detected, as the ideas will be deterred before they have a chance to blossom. Resistance to implementation or ineptitude in the management of change will eventually become evident in a low percentage of successful implementations.” Whatever the rationale, managers filter ideas and worthy proposals may be screened out. A consistent and formal process with benchmark indicators is useful to overcome the deterrence that may inhibit an organization’s innovation effectiveness.

Employees who are familiar with the organization’s business processes and who use the tools to perform their jobs are excellent sources for identifying potential improvements. Whether the proposed change is small or large, the way in which management facilitates the contribution may determine whether there is an early success or failure. The ad hoc approach of an office suggestion box or informal conversations with supervisors are not enough to engage employees. An evidence-based practice removes personal bias that could undermine the evaluation process. A formal idea solicitation and evaluation policy provides uniform procedures and instills confidence that leadership is responsive to change. The procedures should encompass four basic stages as depicted in Figure 1, leading up to project initiation that would then apply program management criteria. The stages are:

- Concept: an initial idea to improve an existing process or product.
- Consideration: business case analysis of feasibility, cost and likelihood of success.
- Evaluation: determining the merits of an enterprise investment decision.
- Approval: decision to commit resources and appoint responsibilities.
- Initiation: creating a project.

Proceeding through the process, from idea conception to approval, the probability of initiating a proposal diminishes and is particularly susceptible in the selection zone that has historically relied on the subjective inclination of management. The International Organization for Standardization (ISO) is developing management standards of terminology, tools, methods and interactions between relevant parties to enable innovation (ISO TC 279). Establishing and adhering to innovation process standards will ensure that idea fruition is not dependent on personal predilections. Also, having an innovation index will provide a quantitative indicator to identify strengths and weaknesses at each process stage. With recurring use, the index data will more accurately tell the story of the organizational innovation performance.

### Innovation Index—Measuring Innovation Culture

An organization may tacitly support—or, at a minimum, not stifle—innovation. But applying organizational indicators will enable performance assessment and drive change. Tsutomu Harada last year wrote that “innovation probability should be the unit of analysis in the face of uncertainty.” Research indicates that the oldest firms tend to exhibit lower innovative probabilities, and larger firms by virtue of size increase the probability of innovation. Consistent historical data do not yet exist to benchmark the innovation probabilities within the selection

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**Figure 1. Innovation Stages**

- **Concept** ($P_1$)
- **Consideration** ($P_2$)
- **Evaluation** ($P_3$)
- **Approval** ($P_4$)
- **Initiation**

**Probability ($P_n$)**

- **Selection Zone**
- **Novel, Applicable, Value-Add**
- **Feasible, Business Case Analysis**
- **Impact Analysis, Management Buy-In**
- **Approval, Support, Resources, Leadership Endorsement**

**Figure by the author.**
Examining an innovation engagement technique will illustrate the value of the probability index concept. The example links effective management action to outcome on maximizing innovation probability.

Crowdsourcing is a proactive idea-generation strategy to inexpensively and efficiently solicit employee contributions to improve or solve organizational issues, an approach that may increase participation compared to passive ideation. The use of motivating activities such as crowdsourcing increase the probability that innovation will occur, as opposed to focusing solely on maintaining established business processes. Kira Furuici and Isabel Seidel have said that, in conducting crowdsourcing, offering the targeted audience an incentive will affect the response rate. One organization reported crowdsourcing response rates ($P_1$) between 5 percent and 12.3 percent, the latter based on an innovation crowdsourcing tournament to solicit ideas from clinicians about how to enhance the use of evidence-based practices within a large public behavioral health system (Rebecca E. Stewart, et al., in Implementation Science, 2019). Analyzing the Stewart, et al., crowdsourcing project as an innovation process example offers insight into the selection zone probabilities as listed in Table 1. For this particular structured event, the probabilities exhibit the level of workforce engagement and the subsequent management adjudication.

When measuring indicators are adopted, over time as more data are collected, the probabilities would more accurately reflect specified characteristics of the organization’s innovation culture. Resistance to ideas, consideration and approval leading to implementation will be evident in low probability index ratings. While there is no assurance that procedures and indicators would maximize innovation, a formal governance foundation supported by empirical data will provide open and fair consideration. Examining the influence from corporate entrepreneurship and intrapreneurship on white-collar workers’ employee innovation behavior, Bjorn Willy Amo of Nord University in Bode, Norway, in 2006 reported that “There was a substantial (0.64) and highly correlated ($p<0.01$) relationship between the organization’s desire for employee innovation behavior and the employee innovation behavior.” The approval rate of innovation projects is a call to action by commitment of resources, important for demonstrating more than perfunctory policy. The following basic quantified expressions are lag metrics to evaluate a culture of soliciting, formally reviewing and approving innovation projects.

- **Consideration** = $P_2 = \frac{(# \text{ qualified ideas})}{(# \text{ employees})}$ per year
- **Evaluation** = $P_3 = \frac{(# \text{ feasible ideas})}{(# \text{ employees})}$ per year
- **Approval** = $P_4 = \frac{(# \text{ approved ideas})}{(# \text{ employees})}$ per year

### Conclusions and Recommendations

An organizational innovation framework improves the opportunity for maximizing positive change from ad hoc to a systematic approach for success. Innovative index probabilities provide an objective measurement of an organization’s innovation culture. To begin determining if innovation is meaningful within organizations, I recommend the following actions:

- Create procedures for each process stage from concept to approval.
- Identify five organizations that have a history of innovation or that have successfully implemented innovation projects; collect probability data for each process stage.
- Implement a 12-month pilot test at five organizations using the procedures and concurrently at five control organizations with no procedures. Collect probability data at all test organizations to determine if the procedures demonstrate improved ideation rate.

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### Table 1. Innovation Index Example

<table>
<thead>
<tr>
<th>Process Stage</th>
<th>Crowdsource Tournament Data</th>
<th>Probability (P) Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concept</td>
<td>65 ideas submitted by 55 participants from a population of 527</td>
<td>$P_1 = (65/527) * 100 = 12.3%$</td>
</tr>
<tr>
<td>*Consideration</td>
<td>65 ideas refined to 22 by research team eliminating ideas not actionable</td>
<td>$P_2 = (22/527) * 100 = 4.2%$</td>
</tr>
<tr>
<td>*Evaluation</td>
<td>6 ideas selected by expert committee for further refinement and development</td>
<td>$P_3 = (6/527) * 100 = 1.1%$</td>
</tr>
<tr>
<td>*Approval</td>
<td>1 idea of 6 ranked highest both by expert committee and by 85 representatives from the 527 crowdsore population</td>
<td>$P_4 = (1/527) * 100 = 0.2%$</td>
</tr>
</tbody>
</table>

* Within the selection zone.

Table by the author.
Sources and Suggested Reading List


Prosci, Inc. (undated online), Manager/Supervisor’s Role in Change Management.


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EVEN IN THE CURRENT ERA OF RECORD defense budgets, quickly delivering lethal, effective weapon systems appears an elusive goal in the Defense Acquisition System, especially for major programs. Congress, the Office of the Secretary of Defense and the Services continue to enact laws and publish policies to field capabilities faster. Examples include Joint and Service urgent needs, Fiscal Year (FY) 2016 National Defense Authorization Act Section 804 rapid fielding and prototyping authorities, and streamlined decision chains such as those in the 2003 Air Force Rapid Capabilities Office and 2018 Air Force rapid procurement charters. All of these initiatives seem to assist more at program inception as they guide structuring the acquisition. For those programs already under way, however, these initiatives may not provide much help.

**Verification Chips on the Table**

Between 1990 and 2010 testing comprised roughly 50 percent of aircraft platform acquisition schedules and a whopping 80 percent of the duration of program schedules for weapons. These figures

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By continuing to look at test fidelity in more levels of complexity, the DoD can find additional efficiencies in verification programs to speed weapon systems to the field.

indicate verification programs are fertile ground for Service leadership to influence both the timing and quality of new capabilities delivered through acquisitions. This influence, which traditionally manifests in the form of trade-offs, may be applied by shining a light on test program content in a senior leader forum.

In fact, an area of strategic interest to program executive officers (PEOs) is the system verification campaign in Major Defense Acquisition Programs. This group voiced its opinion in the Defense AT&L magazine (the predecessor to this publication) article “Improving Acquisition from Within—Suggestions From Our PEOs:”

Configuration Steering Boards (CSBs) and Testing: CSBs have been especially helpful in adjusting requirements (both to provide a forum for the deliberate addition of some requirements as well as removing some requirements where they don’t make sense). This process should be extended to include using the CSB process to adjust test plans and requirements as well rather than allowing independent members of the test community virtually unlimited authority to commit programs to cost and schedule of tests that the operational leaders of the Service do not believe are warranted. Similarly, it would provide a forum for those same uniformed leaders to insist on testing that might otherwise be overlooked.

Trading Test Activities for Program Schedule
There are several ways programs cut testing to meet schedule. With their backs to the wall, program managers may be tempted to simply cut the tail end of testing to meet a fielding milestone date. Test campaign cuts may also be made with an eye on systems engineering criteria such as risk to achieve a subset of specifications. They may even go one step further and include consideration for “big R” user requirements in Joint Requirements Oversight Council or Service-level capabilities documents.

But these types of traditional systems engineering criteria may not be relevant to the tactical user. Corner-case negative thermal margins in the guidance and control section of a munition may be an issue for a systems engineer, but for the pilot who rarely—or ever—would employ the munition under tactical conditions producing that thermal environment, it would be imprudent to chase this specification at the cost of a delay to Initial Operational Capability. In general, this type of behavior can be self-defeating for Department of Defense (DoD) acquisitions writ large.

And traditional systems engineering is reticent to revisit the type of testing initially proposed by the developer and accepted by the government. As a result, decisions on whether to cut testing often can come down to a binary choice with no middle ground considered along the continuum of verification fidelity.

This is not to say that operational relevance and verification fidelity of a requirement are not in the cross-check of systems engineers or program managers. But our acquisition tool box may not provide a ubiquitous way of conveying this information in decisional meetings.

A Top-Level Focus
In my experiences as a test director, test manager and program manager on five ACAT I programs and one ACAT II program, I have observed a common but informal practice of viewing verification programs through the lenses of operational relevance and test fidelity. These programs attempted to find opportunities to skinny down schedules and deliver a slice of essential capabilities to the field as fast as possible. These efforts always occurred after the acquisition strategy was approved—during execution in Engineering and Manufacturing Development (EMD) when annual CSBs typically would be required for an ACAT I program. I believe that this observed practice aligns with the PEOs’ consensus of how test programs should be managed, and it should be considered for elevation to the CSB level.

Why these two lenses? Operational relevance and test fidelity cut directly to the ultimate purpose of verification in a program; they answer the seminal leadership questions of what’s needed and how we know it works. This is especially true after an acquisition strategy has been approved and program execution inflicts delays and adds
risk to schedule milestones. With these answers in hand, programs can continue along a line of inquiry to help guide adjustments to the verification program to achieve acquisition goals. Finally, I believe that these two views of a verification program enable the CSB to better see if tests are warranted or overlooked, as recognized by the PEOs.

Operational relevance from the perspective of a verification program involves threats—both naturally occurring and developed by adversaries—faced by a weapon system conducting a particular mission or mission set. Depending on how the system is used, the weapon may or may not face all the anticipated threats it was designed to withstand or counter. When delivery schedule is paramount, it may be in the best interest of the Service and the Department of Defense to qualify and test a weapon system for the most urgent subset of missions that expose the item to limited natural environments and adversary threats.

As a tangible example, consider a joint air-launched missile intended for employment by both carrier-capable and conventional runway aircraft designed to counter current and future high-end threats (one type of missile to do nearly everything). Imagine a technical risk arises from setting such a robust employment requirement. This issue leads to a redesign and requalification of an internal isolation structure for a flight computer to mitigate the repeated shock impulses of carrier catapults and landings (cats and traps). Furthermore, the latest Validated Online Life-cycle Threat (VOLT) projects a delay in a next-generation adversary capability, allowing the program to delay verification of an advanced self-protection countermeasure. These two events—a schedule setback and threat relief possibility—provide opportunities to adjust the verification program schedule, albeit with implications to the acquisition strategy’s capabilities fielding date. This is the type of situation the CSB is meant to address.

Test fidelity is akin to the verification method, except it is richer in detail. It affords an opportunity to more precisely tailor verification needs to what the stakeholders value as essential to a particular mission or mission set. Exactly this level of insight is needed to provide the 360-degree awareness enabling more sophisticated tailoring by senior decision makers. Test fidelity illuminates the interdependency between “speed to need” and operational effectiveness with a deeper understanding of the risks posed to confirming that the weapon system will function as intended in the field.

Test fidelity expands on the broadly grouped verification methods used in the DoD—examination, analysis, demonstration and test—to include more aspects such as the test environment, test article configuration and use case. For example, the verification method “test” could be expanded to include the test article representativeness to the production configuration and the tactical similarity to the employment scenario planned. These additional attributes of the verification method describe its test fidelity, and this fineness of detail can be used to make strategic decisions such as taking credit for operational test points during a program’s developmental test phase. This example, of course, is the integrated test policy codified in the DoD Instruction 5000.02 implemented to accelerate acquisitions. By continuing to look at test fidelity in more levels of complexity, the DoD can find additional efficiencies in verification programs to speed weapon systems to the field.

Arming annual CSBs with these insights would be a step in the right direction to formalizing consideration of operational relevance and test fidelity at a decision-making level especially empowered to compel action. This is true even if the action drives a change in the approved acquisition strategy for executing programs. An easily digestible, conceptualized visualization for adjusting verification program requirements through these two lenses could provide the decision aid structure to facilitate implementing the PEOs’ vision for future CSBs.

**Operational Relevance and Test Fidelity**

So what should this visualization tool look like? One way to answer this question is to introduce a hypothetical (yet plausible) example.

Consider a scenario in which a USAF missile EMD program is executing all-up system integration testing, but the program is projected to overran a major program date. Of all the capabilities to be verified, performance against threat countermeasures is causing negative schedule margin along the driving path to the milestone. The annual CSB date is approaching and test/schedule tradeoffs are expected to be prominent in the discussion based on pre-meeting staff work. In preparation for the board, the program office builds slides according to the SAF/AQ (Air Force Acquisition) template and adds a chart with the graphic shown in the figure. The image shows which threat countermeasures still require testing, the percentage of threats employing a particular countermeasure type, and the fidelity of testing. Additionally, the program office labels blocks of testing with planned durations pulled from the latest Integrated Management Schedule (IMS), and this information is presented in the context of the overarching schedule milestones to aid in the review. The tool guides discussions among technical experts, warfighter representatives and program managers present at the meeting leading to a decision by the board satisfying the varied needs of all stakeholders.

The decision in this scenario is unimportant. Rather, it is the structure and information provided by the visualization
tool that guide shrewd managerial discourse at a level of authority empowered to affect change for the better. Its simplicity provides a clear picture to senior leadership by conveying a conceptual view of verification progress and what trades in test fidelity and operational impacts can be made to meet milestone dates. Importantly, this crisp visualization tool facilitates exactly what the PEOs recommended: using the CSB process to “adjust test plans and requirements” and enabling operational leaders in the Services to influence test scope.

Building the Visualization Tool
Information needed to create this decision aid can be sourced readily from existing program data. In the previous example, operational relevance was represented as the type of countermeasure, which may be found in the VOLT and related intelligence documents, and frequency of encounter, which may be drawn from mission- and engagement-level simulations already populated with threat data. Test fidelity can be found in many places including an overarching system verification plan (if contracted) and the IMS, which could also provide the duration of test activities.

Recognizing which capabilities to track should be based on critical capabilities designed into the weapon system, verification tasks on schedule driving paths, or any other consideration deemed important by the program. Critical capabilities may be described in select Key Performance Parameters; Key System Attributes; Additional Performance Attributes; and Technical Performance Measures—or, if finer granularity is required, some other salient system capability depending on program timing. Beyond criticality, the selection of capabilities for monitoring may be based on schedule durations impacting important intermediate milestones (this selection criterion was used in the preceding example).

Conclusion
This article advocates elevating an observed practice in program offices to the CSB to help make better-informed decisions on verification program adjustments and squeeze more value out of test. A simple yet powerful visualization tool is proposed as a decision aid to help guide discussions regarding test program adjustments to meet a broad set of stakeholder needs. This visualization tool can be built leveraging data already available to program offices. By viewing test programs through the lenses of operational relevance and test fidelity, CSBs can address the concern voiced by PEOs regarding the amount of influence Service operational leaders wield on test programs. The author can be contacted at david.petrucci@us.af.mil.

Figure 1. Verification Methods Against Target Countermeasures by Threat Type and Frequency*

*Fictitious example of the visualization tool proposed for CSBs reflecting the operational relevance and test fidelity of a hypothetical missile capable of employing different types of countermeasures against targets.

Figure by the author.
Coast Guard Role in the Great Power Competition

James Landreth, P.E.

IN LATE MARCH 2019, THE COAST GUARD CUTTER (CGC) BERTHOLF (WMSL-750) SLICED THROUGH THE waves in a joint exercise with USS CURTIS WILBUR (DDG-54). Though the BERTHOLF normally supports Joint Interagency Task Forces (JIATF) on counter-narcotics, on this mission it led the formation in a freedom of navigation (FON) exercise through the Taiwan Strait.

The Chinese media challenged the legitimacy of a U.S. Coast Guard (USCG) vessel patrolling so far from the U.S. coast, BERTHOLF’s presence provided a clear signal of the U.S. commitment to FON in the Western Pacific. The deployment of a USCG asset on this particular mission also underlined the U.S. commitment to the international order while minimizing the perception of escalation that would be triggered by the presence of U.S. Navy (USN) combatants.

Beginning with the 2012 “Pivot to Asia” and fully emphasized with the 2018 National Defense Strategy, U.S. strategies increasingly focus on the “Great Power Competition” (GPC) unfolding between the United States and its near peer competitors. The majority of the USCG’s missions support homeland security, but its responsibilities to the Department of Defense (DoD) as a military Service necessitate support for the GPC. To ensure readiness to support U.S. policy amidst

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the GPC, the USCG must define its unique contributions to the GPC, articulate budgetary requirements to fulfill its intended roles and deliver outsized return on investment (ROI) through robust joint and multi-national partnerships.

The USCG Role

The USCG possesses myriad authorities and capabilities for the GPC that differentiate it from its significantly larger sister Service, the USN. However, the USCG leadership must balance requests for forces (RFF) from the DoD against its normal Department of Homeland Security (DHS) mission set. In order to ensure that delivered forces provide the maximum benefit to DoD without draining readiness for its DHS portfolio, the USCG must advertise its unique capabilities to act as a force multiplier for DoD assets at the strategic, operational and tactical levels of war.

- **Strategic Level.** Due to its fluency in DHS, DoD, intelligence community (IC), law enforcement and interagency realms, the USCG’s combination of authorities and capabilities bridge a number of strategic initiatives outlined in the 2017 National Security Strategy. Traditionally viewed as a junior partner in joint operations with DoD, the USCG must grasp and assert the value it brings to the GPC. The USCG maintains an adequate footprint among the Services at the Pentagon, but the USCG must build upon its success with the U.S. Southern Command and deepen its relationships with geographic and functional combatant commanders (COCOM). Similarly, as a member of the intelligence and law enforcement communities, the USCG must conduct key leader engagement to ensure that its equities are well represented across the agencies.

Finally, even when not obligating assets, the USCG should participate in as many joint planning exercises as possible. As recently articulated by Marine Corps Gen. Joseph F. Dunford, any future conflict in the GPC environment will require dynamic force employment globally. Since COCOM RFFs regularly exceed the capabilities of all the military Services, a modest investment in planning and liaison officer participation will pay significant dividends in communicating the types, quantity and endurance of units requested for GPC contingencies.

- **Operational Level Basing.** The USCG bases its assets to provide operational level contributions globally. The homeport strategy for the National Security Cutters (NSC) provide a great example of this flexibility. Basing in Alameda, California, and Charleston, South Carolina, ensure that the USCG’s capital ships can respond to contingencies on either side of the Panama Canal. Furthermore, basing in Honolulu, Hawaii, provides geographic proximity to the Barents Sea and the Western Pacific. Finally, the homeport strategy of the NSCs integrates with the wider distribution of USCG medium endurance cutters, patrol boats and aircraft to ensure the quality of rapid force generation capabilities.

- **Global Reach.** The range of the ice breakers, NSCs and the high endurance cutters make the USCG’s “long range enforcer” platforms suitable for international support. BERTHOLF’s deployment through the Taiwan Strait provides an excellent example of this capability. And long-term relocation of smaller units, such as those deployed with Patrol Forces South West Asia (PATFORSWA), display the USCG’s ability to build partner capacity far from the homeland.

The USCG’s acquisition of the Polar Security Cutter (PSC) will increase both the number of ice breaker hulls and the U.S. ability to maintain presence and project power in the Arctic. The USCG’s unique combination of law enforcement, defense and other authorities are critical at the planet’s poles. Receding polar ice, increasing natural resource exploration and northern transportation routes are opening a new front in the GPC (e.g., Northwest Passage from Europe to the U.S. West Coast, China’s Arctic Road from East Asia to Europe). Critical to the PSC acquisition, the USCG and USN created an integrated program office (IPO) that combine the business acumen of both Services’ acquisition corps. Not only will the joint venture provide expanded human capital for the USCG, but the IPO will provide a model of interService collaboration to address GPC challenges.

- **Coastal Defense.** Over the last decade, the U.S. shale gas and tight oil revolution tipped global energy markets in the United States’ favor. The epicenter of the U.S. energy revolution and interface with global markets is the Texas Gulf Coast. Because the majority of foreseeable conflicts associated with the GPC involve disruption of energy markets, the Texas Gulf Coast will be a center of gravity for U.S. economic mobilization. While only DoD can provide certain capabilities (e.g., missile defense, anti-submarine warfare), the USCG is uniquely equipped and based to provide a layered defense to critical infrastructure. In addition, the USCG’s law enforcement and maritime inspection authorities will be in great demand to ensure coastal safety. And finally, the USCG must align the Auxiliary for the GPC. While the network of Auxiliaries has many legal limitations, these 26,000 patriots provide 1,800 vessels, 160 aircraft and 1,400 radio facilities to any solution set for the many major challenges associated with large scale mobilization.

- **Tactical.** The USCG’s employment in traditional as well as GPC missions offer numerous opportunities for tactical action that directly support the GPC. For example, during traditional DHS counter-narcotics missions, the USCG
Because the majority of foreseeable conflicts associated with the GPC involve disruption of energy markets, the Texas Gulf Coast will be a center of gravity for U.S. economic mobilization.

should use biometric enrollment of criminals to ensure national databases receive maximum intelligence gain. Additionally, the USCG should ensure its platforms are interoperable with DoD helicopters, signal exploitation capabilities and unmanned vehicles. While interoperability may require platform modifications, the tactical ability to receive and husband shared assets dramatically increases the potential of each hull operating independently or in a surface action group.

The Never-Ending Budget Battle
As the national security enterprise shifts its focus to the GPC and invests in “high end” capabilities, competition for budgets will become steeper. And increasing non-discretionary spending (e.g., Social Security and interest on national debt) will consume an ever-larger share of total federal outlays. Ensuring resilience while increasing capability will be difficult for financial managers, but the USCG’s history of success in the face of austerity positions it to excel in the future budgetary environment. Certain strategic thinking can further galvanize the USCG’s status as an “anti-fragile” organization in the face of fiscal pressure.

While an increasing number of COCOMs are expressing interest in global support from USCG assets, the USCG’s logistics support enterprise historically optimized itself for the DHS missions. Though the USCG’s participation in global commitments (e.g., PATFORSWA) make it eligible for overseas contingency operations (OCO) funding, the uncertain nature of OCO funding does not meaningfully factor into life-cycle management strategies for major platforms such as large cutters and airframes. Since COCOMs only provide limited financial support for assets under their operational command, the USCG should be able to participate in DoD’s extensive theater logistics enterprise when supporting Title 10 missions. Codified access to Defense Logistics Agency (DLA) assets and contract vehicles provides the most expeditious means to enhanced platform support while requiring the fewest additional resources. Focused efforts such as cross cataloging of supply parts with the Defense Logistics Information Service-DLA will ensure that there is efficient access to resources when engaged in Title 10 support abroad. For any enduring missions like PATFORSWA, the USCG’s equities must be represented in the Joint Theater Logistics plan.

According to Title 14, when directed to do so, the USCG operates as a Service in the USN. Supporting this law, multiple instructions from the Chief of Naval Operations assign the USN responsibilities to outfit the USCG with equipment that will maximize interoperability with the USN. While the USN prioritizes equipping the USCG in its overall planning, programing and budgeting cycle, USCG technology managers must ensure that their assets remain visible on the budget priority lists of USN program executive offices. With all due political savvy, when USN budgets result in a gap for USCG hulls, USCG stakeholders must ensure that their USN counterparts understand the resulting capability loss for GPC scenarios. Furthermore, the USCG should seek entrepreneurial opportunities to benefit from the USN’s purchasing power on critical technologies with expensive developmental cycles (e.g., Command, Control, Communications, Computer, Intelligence, Surveillance and Reconnaissance equipment and unmanned vehicles).

Critical in all aspects of the GPC, USCG personnel must bring creativity and innovation to every problem set. In order to develop leaders and teams with these attributes, personnel must have access to both traditional as well as agile tools for leader and skill development. Although premier institutions such as the USCG Academy, Training Center Yorktown and Training Center Petaluma will remain bulwarks for formal instruction and standard setting, the USCG also must invest in alternative delivery methods to enable agile skill development.

The USCG’s use of the Defense Acquisition University and the Federal Acquisition Institute provides a model of success for blended online and classroom learning. Not only does the blended approach provide scalable skill development, it leverages existing internet hosting services and investment by DoD to deliver the needed training. The USCG Force Readiness Command should identify other affordable and modular training resources capable of augmenting existing formal instruction programs. The USCG should continue to incentivize the accrual of industry credentials. Civilian certifications such as the Merchant Mariner Credential program and Professional Engineer licensure offer the USCG broad benefits at low cost, and these standards organizations provide enhanced technical credibility for participating individuals and all the Services. Finally, the
USCG should continue to integrate itself with DoD’s War Colleges and the National Intelligence University. The joint professional military education and decisive leadership skills accrued at these initiatives will prove essential for success in the GPC.

**Delivering Outsized Return on Investment**

Much has been written about U.S. Central Command’s (CENTCOM) "By, With, Through" approach in the execution of Operation Inherent Resolve, but the USCG has been employing this model successfully and sustainably with its partners in Central and South America for years. While the USCG can learn a great deal from the scale of the successes achieved by CENTCOM, the USCG should confidently advertise its own success in the JIATF counter-narcotics campaign. During steady state operations, the USCG maintains more than 60 bilateral agreements with partner nations to combat transnational criminal organizations (TCO) and counter-proliferation security initiatives. The USCG must continue to build results-driven partner capacity, and dedicate its high-end capabilities to addressing the key vulnerabilities of weak states where TCOs and near peer adversarial powers exert outsized influence.

In addition to direct bilateral agreements, the USCG employs its network of International Port Security Liaison Officers (IPSLO) that represent USCG equities to the Senior Defense Officials at U.S. Embassies abroad. In so doing, the USCG further amplifies the bilateral efforts of the United States in securing the waterways, and it equips the U.S. Department of State to influence countries diplomatically and negotiate appropriate levels of burden sharing. Beyond coordination with diplomats and the U.S. agencies, the IPSLO program offers a means for the USCG to collaborate with international governmental organizations such as the International Criminal Police Organization and the International Atomic Energy Association.

In addition to its involvement with DoD, DHS, IC and interagency efforts, the USCG provides critical enablers to the Department of Commerce. The USCG’s maintenance of the Marine Transportation System enables the safe movement of $4.6 trillion of economic activity annually along 25,000 miles of coastal and inland waters. The USCG recapitalization of its inland waterway fleet is under way, but the Service must not merely replace old ships with new ships. The USCG must look for innovative ways to integrate an array of 21st-century technologies to improve the efficiency of operations in our nation’s network of rivers. Improved use of information technology, sensor data, radio frequency identification tags and commercially available satellite imagery could all provide asymmetric advantages to the current inland waterway fleet. Additionally, the inland waterway fleet could dramatically increase efficiency and reduce operational costs through the employment of unmanned underwater vehicles that help with underwater inspection of aids to navigation, accurately map hazards to navigation and improve awareness of underwater infrastructure health.

**Addressing the Critics**

Because of the USCG’s already complex portfolio, perennial underfunding and concerns over DoD’s willingness to drain USCG assets’ readiness, some well-intentioned USCG advocates recommend a fundamentalist approach to the USCG’s role in U.S. security policy. Specifically, the USCG should focus on its existing and exhausting task list, and force the DoD to handle power projection and management of global security commitments. Absent dramatic increases in long-term funding levels and enhancements to existing infrastructure, significant risk exists that the USCG will be stretched too thin to perform any of its tasks well and will lack resiliency in anything less than optimal scenarios.

While defenders of the status quo present important concerns over budgets, readiness, infrastructure and resiliency, the history of the USCG is replete with evolutionary tales. For example, the name of CGC MUNRO (WMSL-755) pays tribute to USCG World War II Medal of Honor winner Douglas Munro’s exploits in the Western Pacific. More recently, the USCG’s evolution after Sept. 11, 2001, and incorporation into the DHS reveal the Service’s strategic design as a pillar of U.S. maritime policy. Short of an unexpected cataclysm, the mounting pressure of the GPC will define the security needs of the coming decades. In order for the USCG to fulfill its critical role in the U.S. Sea Services, it must remain externally aware of the changing landscape and rapidly adapt in order to fulfill its motto of Semper Paratus (“Always Ready”).

**Conclusion**

As the GPC crescendo builds, the USCG must assert its unique contributions in order to maximize its utility to the nation as well as ensure the viability of its long-term investments. However, the ever-increasing assault from the TCOs will continue to require focused attention from the USCG and its interagency partners. Also, beyond the GPC and counter-TCO efforts, the USCG must keep a steady strain on its additional missions such as maintenance of the inland waterways. In order to provide maximum support to U.S. policy in the GPC, the USCG must articulate a precise narrative detailing its strategic competencies for the GPC, develop budgets that provision its existing missions and intended GPC roles and continue to deliver outsized ROI through robust joint and multinational partnerships.

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The Honorable Ellen M. Lord, Under Secretary of Defense for Acquisition and Sustainment, hosted the 2019 Defense Acquisition Workforce Awards ceremony on Tuesday, Oct. 29, 2019, with distinguished guest Mr. Thomas F. Carney, Vice Director, Force Structure, Resources and Assessment, Joint Staff, J8. The Defense Acquisition Workforce Awards recipients represent the best of the best across our acquisition community. The winners’ accomplishments will be on display in the Pentagon on the Defense Acquisition Workforce Wall of Recognition display.

The ceremony, which took place at the Pentagon Hall of Heroes, recognized acquisition professionals and organizations for their commitment to acquisition excellence through the presentation of:

- Defense Acquisition Workforce Individual Achievement Awards
- Software Innovation Team Award
- Flexibility in Contracting Award
- Defense Acquisition Workforce Development Innovation Awards

The Defense Acquisition Workforce Individual Achievement Awards highlight individuals who demonstrated an exemplary commitment to excellence and professionalism in the acquisition of products and services for the Department of Defense (DoD). These awards recognize individuals in each of 19 acquisition functional disciplines. This year’s program includes two new Individual Achievement Awards—International Partnership and Software—and one new Software Innovation Team Award. It is necessary to recognize these communities and their role in providing the best capabilities to our Warfighters.

Software is a crucial and growing part of weapons systems. New this year, the Software Innovation Team Award recognizes those who epitomize innovation, and use of best practices in software development and acquisition as evidenced by frequent and high quality delivery of software capabilities into the hands of Warfighters.

The Flexibility in Contracting Award was established by Section 834 of the National Defense Authorization Act for Fiscal Year 2017. The award recognizes outstanding professionals who have, in their approach to program management and contracting, demonstrated “innovation and local adaptation” by using the flexibilities and authorities granted by the Federal Acquisition Regulation and the Department of Defense Instruction 5000.02 (Operation of the Defense Acquisition System) to increase the efficiency of programs.

The Defense Acquisition Workforce Development Innovation Awards recognize excellence by acquisition organizations in developing unique and innovative solutions to ensure that their workforces are well equipped to deliver world-class capabilities to the Warfighter. The awards highlight exceptional outside-the-box thinking and progress in tackling workforce development challenges.

Photos by Mr. Dirke Williams, Office of the Under Secretary of Defense for Acquisition and Sustainment.
Individual Achievement Award Winners

Major Eugene Choi | U.S. Army | Acquisition in an Expeditionary Environment

Major Eugene Choi served as the lead Administrative Contracting Officer in the 414th Contracting Support Brigade, where he led the highest operating tempo team on deployments throughout the U.S. Africa Command. He provided contingency services to the Logistics Civil Augmentation Program (LOGCAP), delivering services to more than 16 sites in seven African countries. Major Choi also oversaw the LOGCAP contract valued at $1.7 billion, which supports more than 14,000 personnel at seven sites throughout Iraq. Through his leadership, Major Choi saved $12 million on food expenditures and created quality assurance documents for property and personnel management.

Ms. Jessica Oliver | Defense Contract Audit Agency | Auditing

As a senior auditor, Ms. Jessica Oliver developed a guide to identify estimating system deficiencies, which significantly advanced the Raytheon Integrated Defense Systems office’s understanding of price proposals and estimating practices. She accepted a critical role in examining proposals totaling more than $1.5 billion, issuing audits ahead of schedule. Ms. Oliver created risk assessment templates that saved 100 hours on an audit. She consistently pursues the advancement of her team’s knowledge by creating and sharing new approaches. Her efforts contributed to more than $90 million in reported pricing exceptions.

Mr. Simon Klink | U.S. Navy | Contracting and Procurement

Mr. Simon Klink is a Contracting Officer for the Block 4 Follow-On Modernization Program, within the F-35 Joint Program Office. His leadership resulted in the award of more than 20 contract actions valued at more than $4 billion that transitioned the program from predevelopment risk reduction to capability delivery. His cost and price analysis and negotiating ability led to a business deal approved by foreign and domestic customers. Mr. Klink established a tailored continuous learning program, resulting in improved work products and increased collaboration.

Ms. Nicole Gulla | U.S. Army | Cost Estimating

Ms. Nicole Gulla is a Cost Analyst for the Joint Program Executive Office for Armaments and Ammunition. Her contributions to the Close Terrain Shaping Obstacle program resulted in a nearly $500 million reduction of estimated funding requirements, and her cost analysis shaped the program’s path forward. Ms. Gulla identified cost efficiencies for the Standoff Activated Volcano Obstacle program through the utilization of Other Transactional Agreement contract vehicles and the middle-tier acquisition approach—one of the first programs approved by the Army to do so.
Individual Achievement Award Winners (continued)

**Ms. Melissa Ransom | U.S. Marine Corps | Earned Value Management**

As a Cost Analyst for the Ground Air Task Oriented Radar program, Ms. Melissa Ransom provided essential leadership in Earned Value Management. Her insight and analysis proved instrumental in the review of the prime vendor cost estimating system deficiencies, and, once implemented, her corrections provided greater data integrity for the program. Ms. Ransom’s analysis of contract types, data trends, and risk assessment were critical during the negotiation of the Full Rate Production contract and resulted in a total, life-cycle cost savings of $40 million per system.

**Mr. Joseph Krumenacker | U.S. Navy | Engineering**

Mr. Joseph Krumenacker, F-35 Joint Program Office Chief Engineer, expertly led two complex engineering investigations that helped resolve propulsion system safety issues. In response to an F-35B loss of aircraft, Mr. Krumenacker led a team that confirmed the root cause failure of a high-pressure, high-volume fuel tube. He provided time-critical engineering responses that kept more than 400 aircraft operating safely. During this period, Mr. Krumenacker established a working group that implemented thrust cutback solutions to restore full vertical landing capability.

**Ms. Laureen Borochaner | U.S. Army | Facilities Engineering**

As the Engineering Division Chief at the Army Corps of Engineers, Ms. Laureen Borochaner was responsible for the engineering, design, and construction of numerous complex projects. Her achievements include the successful execution of the U.S. Army Corps of Engineers’ largest dam rehabilitation at Herbert Hoover Dike in Florida; the rebuilding of the Guajataca Dam in the aftermath of Hurricane Maria in Puerto Rico; designing Everglades restoration projects valued at $2.6 billion; and more than $3 billion in civil works design projects.

**Ms. Julie Blankenbaker | U.S. Navy | Financial Management**

Ms. Julie Blankenbaker, Deputy Program Executive Officer for Unmanned Aviation and Strike Weapons in Business Financial Management, led the Naval Air Systems Command (NAVAIR) realignment to a mission-aligned organization. As a leader of the financial management community, she reduced nonessential reporting, provided innovative financial solutions to program managers and financial managers. Ms. Blankenbaker played an instrumental role in terms of providing financial dashboards and visualization of financial information and was key in embracing real-time, online, transparent data storage that could be visualized by a variety of personnel.
Captain Yazmin Garcia Smith | U.S. Air Force | Information Technology

As a project manager at the Intercontinental Ballistic Missile Systems Directorate, Captain Yazmin Garcia Smith led a team in the acquisition planning and expansion of the $34 million Ground Based Strategic Deterrent Digital Engineering System. This effort enables multi-level IT integration for the $83 billion Intercontinental Ballistic Missile weapon system replacement program. She developed the IT deployment strategy to build out and install a multi-level, Digital Engineering Environment across 23 sites within 18 months. Captain Garcia Smith saved approximately $90,000 in costs in addition to eliminating 60 days from the deployment schedule. Her efforts are paramount to maintaining the nation’s key nuclear deterrent.

Ms. Jean-Anne Butler | U.S. Air Force | International Partnership

Ms. Jean-Anne Butler, as a coalition procurement advisor to the Afghan Ministry of Defense, was responsible for advising an international partner on commodity, service and construction acquisitions valued at $4.5 billion annually. Her expertise resulted in a thorough review of the Afghan procurement processes and establishment of standard procurement lead times, which greatly increased out-year planning from 1 to 3 years. As a result, the Ministry achieved a 95 percent rate of budget execution, by far the highest of all 42 ministries.

Chief Warrant Officer 4 Martin Lopez | U.S. Marine Corps | Life Cycle Logistics

Chief Warrant Officer 4 Martin Lopez, as Maintenance Advisory Officer for Armored Vehicles, provided logistics support to the M1A1 Abrams Tank program. He identified an excessive intake of foreign particles that negatively affected the Nuclear, Biological, and Chemical (NBC) System. Chief Warrant Officer 4 Lopez produced a low-cost solution that increased the operational availability of the tank’s NBC System by 50 percent and reduced the risk of fires. His analysis of the Armored Vehicle-Launched Bridge uncovered costly processes that will result in savings of $20 million over the life cycle of the program.

Mr. James Gregory Clark | U.S. Army | Production, Quality, and Manufacturing

As an Aviation Systems Quality Section Chief, Mr. James Gregory Clark developed processes that increased quality assurance surveillance for spare parts contracts for the Army, saving the government an estimated $673 million. He revamped outdated processes and procedures for the Apache Improved Drive System Main Transmission, which reduced some test audit requirements by 92 percent, reduced travel costs by 69 percent, and created a positive schedule impact.
Individual Achievement Award Winners (continued)

Colonel David Warnick | U.S. Army | Program Management

Colonel David Warnick, a Project Manager for the Joint Attack Munition Systems, effectively managed three Acquisition Category 1 programs across every stage of the life cycle. He preserved and guided the Joint Air-to-Ground Missile program through the Engineering and Manufacturing Development phase and achieved a successful Milestone C decision. He increased HELLFIRE missile production capacity by 450 percent and achieved a unit cost savings of 9.5 percent. These are the largest and most affordable 1-year procurements in the history of the HELLFIRE.

Colonel Sean McMurry | U.S. Army | Requirements Management

As the Joint Product Manager for the Common Analytical Laboratory Systems (CALS), Colonel Sean McMurry masterfully led one of the largest joint acquisition programs within the Joint Program Executive Office for Chemical, Biological, Radiological, and Nuclear Defense. He redefined requirements for the program and integrated off-the-shelf analytic equipment into mobile laboratories. Colonel McMurry’s efforts successfully transformed the acquisition strategy for the CALS Field Confirmatory Integrated System variant—decreasing the expected fielding of the product by 2 years and $44 million under budget.

Lieutenant Colonel Mara Kreishman-Deitrick | U.S. Army | Science and Technology Manager

Lieutenant Colonel Mara Kreishman-Deitrick, a strategic leader in malaria prophylaxis and antibacterial drug development within Walter Reed Army Institute of Research, was the chair of the Next Generation Malaria Drug Integrated Product Team. She completed a first-in-human clinical trial for the lead anti-malarial candidate, created a Milestone Decision Authority (MDA) directed data package on a potential combination therapy to inform a program transition/termination decision, and ensured global relevance of the DoD Antimalarial Drug Development mission.
Ms. Alicia Spurling | U.S. Special Operations Command | Services Acquisition
Ms. Alicia Spurling, an Acquisition Program Manager at U.S. Special Operations Command (USSOCOM), balanced four major programs, led two major source selections, and served as Primary contracting officer representative for 43 contracts. She successfully maintained her existing portfolio, including a $200 million Language and Culture indefinite-delivery-indefinite-quantity contract and a $47 million SOCOM Pacific effort, while balancing requirements shaping, source selection, and transition of the $500 million Preservation of the Force and Family contract. Ms. Spurling also led the $60 million Warrior Care Program contract while coaching and mentoring her peers. Her effort improved communications with industry partners and facilitated the successful award of 51 task orders totaling $189 million.

Mr. Paul Ward | U.S. Special Operations Command | Small Business
As the Deputy Director for Small Business at USSOCOM, Mr. Paul Ward facilitated the largest Disabled Veteran-Owned Small Business Service set-aside, $360 million, by using the All-Small Mentor-Protégé Program. This is the largest acquisition to date in the federal government using such authorities. Through market research and manufacturing facility reviews, Mr. Ward set-aside a historically full, and open, $50 million sniper rifle requirement for small business. Through Mr. Ward’s tenacity, the command set new records for the most dollars ever awarded to Historically Underutilized Business Zones and Women-Owned Small Businesses.

Mr. George Senger | U.S. Army | Software
Mr. George Senger, a lead engineer from the Program Executive Office for Command, Control, and Communications-Tactical, led a team to develop an application that revolutionizes the Soldiers Unit Task Reorganization process. This technology reduces the radio configuration time required for separate units to join a common network, from several hours to minutes. To expedite development, Mr. Senger leveraged cutting-edge business practices, agile software development, and commercial-off-the-shelf products to develop the software for full release in 17 months.

Colonel Varun Puri | U.S. Air Force, Retired | Test and Evaluation
As a Senior Test Leader at the F-35 Joint Program Office, Colonel Varun Puri directed a 1,400-person workforce across four test organizations. Under his leadership, the System Design and Demonstration developmental test program completed more than 9,000 flights, 16,000 flight test hours, and 65,000 test points without significant incident. By implementing this developmental test program, Colonel Puri generated a $45 million cost avoidance. He was awarded the Collier Trophy for his contribution to the early delivery of the Automatic Ground Collision Avoidance System.
Software Innovation Team Award
U.S. Air Force Kessel Run Team
Boston, Massachusetts
Kessel Run is a model for Defense DevSecOps and Agile software acquisition. The Kessel Run Team fielded 18 capabilities, including a tanker-planning tool, using agile software development and lean start-up methodologies. Collaborating with the Mad Hatter team, they modernized the F-35 Autonomous Logistics Information System. Kessel Run can push applications into SIPR in under an hour with the DoD’s first Continuous Authority to Operate, and on a monthly basis, they save operations $13 million and more than 2,000 man hours. Their operational value is unparalleled, delivering capability into the field every 14 hours and averaging 70 days to award contracts.

Flexibility in Contracting Award
National Geospatial-Intelligence Agency JANUS Team
Springfield, Virginia
The JANUS Acquisition Team is recognized for their innovation and success, resulting in the award of more than 30 contracts in support of Foundation Geospatial Intelligence products. The contracts exceed $2 billion in value and include $320 million in set-asides for small businesses. NGA obligated more than $174 million, spending 60 percent less than anticipated due to the innovative source selection and competitive delivery order processes. The JANUS contracts allowed NGA to purchase higher volumes of data and products, twice as much as compared to the previous contracts.
**Workforce Development Innovation Awards**

Large Organization  
U.S. Army Combat Capabilities Development Command Ground Vehicle Systems Center  
Warren, Michigan  
The U.S. Army Combat Capabilities Development Command Ground Vehicle Systems Center created and implemented workforce development programs to better train and prepare the future acquisition workforce and its emerging leaders. The Center’s initiatives include the Recent Graduate Network, sponsorship and mentorship programs, numerous technical and leadership training opportunities that consist of weekly innovation talks, peer-to-peer, and formal recognition programs. The Ground Vehicle Systems Center’s initiatives will have longstanding positive effects for years to come through the investment, development, and recognition of their workforce.

Small Organization  
U.S. Special Operations Command, Special Operations Forces Acquisition, Technology, and Logistics  
MacDill Air Force Base, Florida  
The USSOCOM Special Operations Forces Acquisition, Technology, and Logistics implemented initiatives to prepare the next generation workforce for greater responsibility by creating opportunities through internship and Ghost programs, specialized trainings, and key-leader development positions. The early career workforce is engaged through a comprehensive program that promotes supervisor-mentoring, career planning, and tailored training. The workforce development team implemented a new community of interest and recruitment site to enhance the workforce and talent management initiatives. The Special Operations Forces Acquisition, Technology, and Logistics organization utilizes novel communication tools and strategies to recruit, retain, and professionalize their workforce to bolster capability readiness.

Visit https://www.hci.mil/what-we-do/awards/Awards-2019-Gallery.html to see a complete photo gallery from the awards ceremony.
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The outstanding acquisition achievements of five military Service programs were recognized at a Dec. 2, 2019, Pentagon ceremony where they received the David Packard Excellence in Acquisition Award. The 2019 Packard Award recipients are the U.S. Air Force (USAF) Launch Enterprise team; the USAF Pitch Day team; the Special Operations Command’s Distributed Common Ground/Surface System; the Special Operations Forces and Tactical Assault Kit Configuration Steering Board teams; and the U.S. Army’s Sub Compact Weapon team.

The award was established to recognize organizations, groups, and teams that have demonstrated exemplary innovation using best acquisition practices that achieve acquisition excellence in the Department of Defense (DoD). It is the DoD’s highest acquisition team award and was first awarded in 1996 in honor of David Packard, a Deputy Secretary of Defense during the Nixon Administration. Mr. Packard also was the co-founder and chairman of the Hewlett-Packard Company and chairman of the President’s Blue Ribbon Commission on Defense Management chartered by Ronald Reagan in 1985. He founded the Defense Systems Management College in 1971 and was a strong advocate of excellence in defense acquisition practices and a revolutionary founder in how we acquire products for the DoD.

In remarks at the Dec. 2 ceremony, Under Secretary of Defense for Acquisition and Sustainment Ellen Lord and Deputy Secretary of Defense David L. Norquist noted that “acquisition excellence, innovation and reform are extremely important in delivering advanced equipment and capabilities that enhance lethality and warfighting readiness and ensure U.S. technological superiority well into the future. The significant achievements of our five Packard Award winners embody these principles and are proof of the tremendous strides we continue to make in changing how we do business to become more agile and obtain greater efficiency and productivity.”

They added: “Congratulations to the winners and all of the nominees for this prestigious award. In recognizing the Packard awardees, we remain fortunate to have many more outstanding professionals dedicated to our mission of providing combat-credible military forces needed to deter war and protect the security of our nation.”
The Air Force Launch Enterprise Team
For its innovative efforts to increase the capability in future launch propulsion and vehicle systems using nontraditional acquisition authorities. The Launch Enterprise team crafted a successful acquisition strategy of innovative public-private investments in launch vehicle development via the competitively awarded Rocket Propulsion Systems program and $2.2 billion in Launch Service Other Transactional Authority Agreements (OTAs). These OTAs were a critical step toward ending reliance on Russian RD-180 engines and paved the way for robust competition in the launch industry, leading to the release of the $8 billion Phase 2 Launch Service Procurement request for proposal for 34 National Security Space Launches, which will make it possible to meet all National Security Space launch requirements for the next 5 years. This will greatly reduce launch costs and increase flexibility and capability to orbit for the Warfighter.

The Air Force Pitch Day Team
For pioneering a ground-breaking event modeled after commercial investment pitch competitions focused on rapidly awarding single-page contracts to nontraditional firms based on streamlined evaluations and in-person presentations. The inaugural Pitch Day showcased a simple and repeatable method to harness commercial technologies to support major program and mission area needs. Air Force contracting officials reviewed 417 submissions during the 30-day application period and, within 30 days, invited 59 businesses to pitch their proposals in person. Of those, 51 received an initial award. The team then effectively scaled the process to include participation from both the Army and Navy, receiving almost 1,100 applications and awarding nearly 450 contracts worth $130 million. This included more than $55 million in private investment and spawned 11 subsequent Air Force Pitch Day efforts in less than a year, driving the DoD to embrace smart risk-taking, challenge nonproductive norms, and share a singular vision for a smarter, faster, more capable force.
The Special Operations Command’s Distributed Common Ground/Surface System—Special Operations Forces (DCGS-SOF) Team

For innovation and technical excellence in developing, experimenting, and fielding of capability to the SOF operator. The DCGS-SOF program distinguished itself by evaluating and quickly implementing new technologies such as cloud native architectures, experimenting with artificial intelligence/machine learning applications, implementing tailored system training processes, and fielding multiple software applications to rapidly provide the SOF intelligence enterprise with improved processing, exploitation, and dissemination capacity and capability. The ability to adeptly implement change management through program subcomponent tailored approaches across a wide spectrum of technologies, organizations, cultures and institutional processes is a testament to the DCGS-SOF program management team. The team’s efforts greatly improve the ability to collect, analyze and disseminate intelligence data in order to provide SOF leadership with increased situational awareness for planning and executing SOF intelligence, surveillance and reconnaissance missions.

The Special Operations Command’s Tactical Assault Kit Configuration Steering Board Team

For its combined efforts in employing Agile Software Development, an Open Technology Development approach, inter-agency collaboration, and innovative program management to deliver game-changing technology to improve the lethality of the Warfighter. As a program, Tactical Assault Kit (TAK) leverages commercial smartphones, servers, and existing radios with a government software core to create a game-changing secure, interoperable, tactical-level common operating picture. The TAK team—comprised of members from USSOCOM, U.S. Army, U.S. Air Force, National Geospatial Intelligence Agency, and the Department of Homeland Security—worked in tandem to produce unique products equipped with the latest commercial technologies for each of their user communities while simultaneously enhancing interoperability on the battlefield to coordinate the actions of ground troops, vehicles, supporting aircraft, and long-range fires in support of real-time combat maneuvers.
The Army’s Sub Compact Weapon Team

For fundamentally shifting how the Army acquires a new capability. By structuring an innovative contracting approach in moving from a standard Federal Acquisition Regulation-based to an Other Transaction Authority approach, the team was able to meet an urgent request for a new, concealable weapon capable of accurately engaging threat personnel with lethal force at close range with minimal collateral damage, delivering a new Sub Compact Weapon system to the field in only 12 months. The team developed a two-stage selection approach, to include a video-based first stage in which the offerors submitted videos to visually demonstrate how their weapons met the minimum go/no-go requirements, and a second phase that streamlined technical testing and Soldier Touch Point to maintain an accelerated schedule. By doing so, they were able to provide a new capability that supports the U.S. Army’s Protective Services Battalion mission to provide continuous, protective close-in security to senior High Risk Personnel. The Sub Compact Weapon team successfully fielded this capability approximately 2.5 years earlier than would have been the case with a traditional Federal Acquisition Regulation-based contract approach with a formal joint requirement.

Left to right: Ms. Rachael Counts, the Honorable David Norquist, Lieutenant Colonel Steven Power, the Honorable Ellen Lord, and Mr. Travis James.

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**Purpose**

*Defense Acquisition* 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 defacq@dau.edu. 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. For each article submitted, please include three to four keywords that can be used to facilitate Web and data base searches.

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.

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**Audience**

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

**Style**

*Defense Acquisition* 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)*.

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**Length**

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**Format**

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