

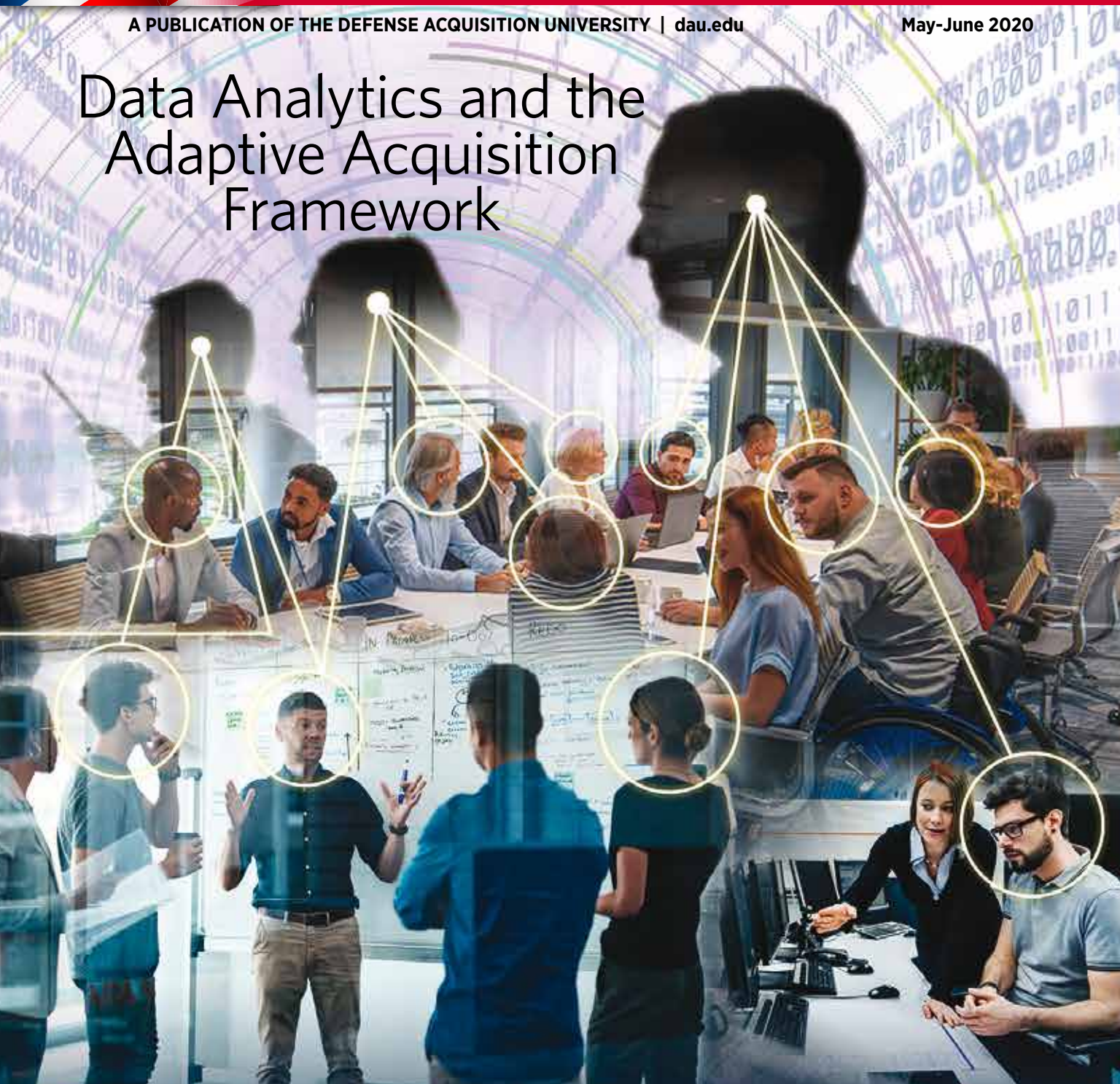
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May-June 2020

Data Analytics and the Adaptive Acquisition Framework



**The Shrinking
Private Supplier
Base and Acquisition Reform**

**Effectively
Communicating the
Acquisition Impact**

**Afghanistan
Operations
Reconstruction
Part II**

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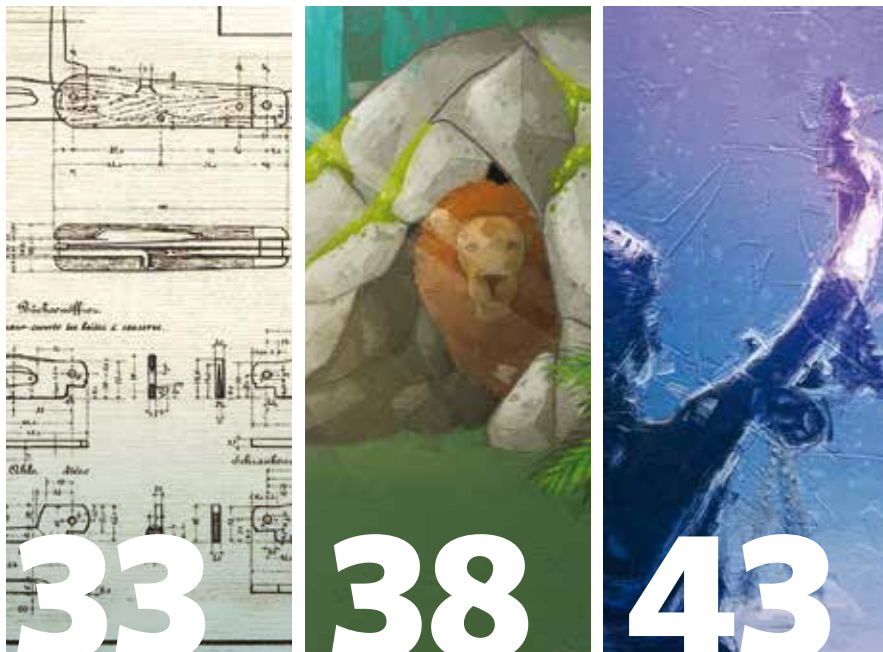
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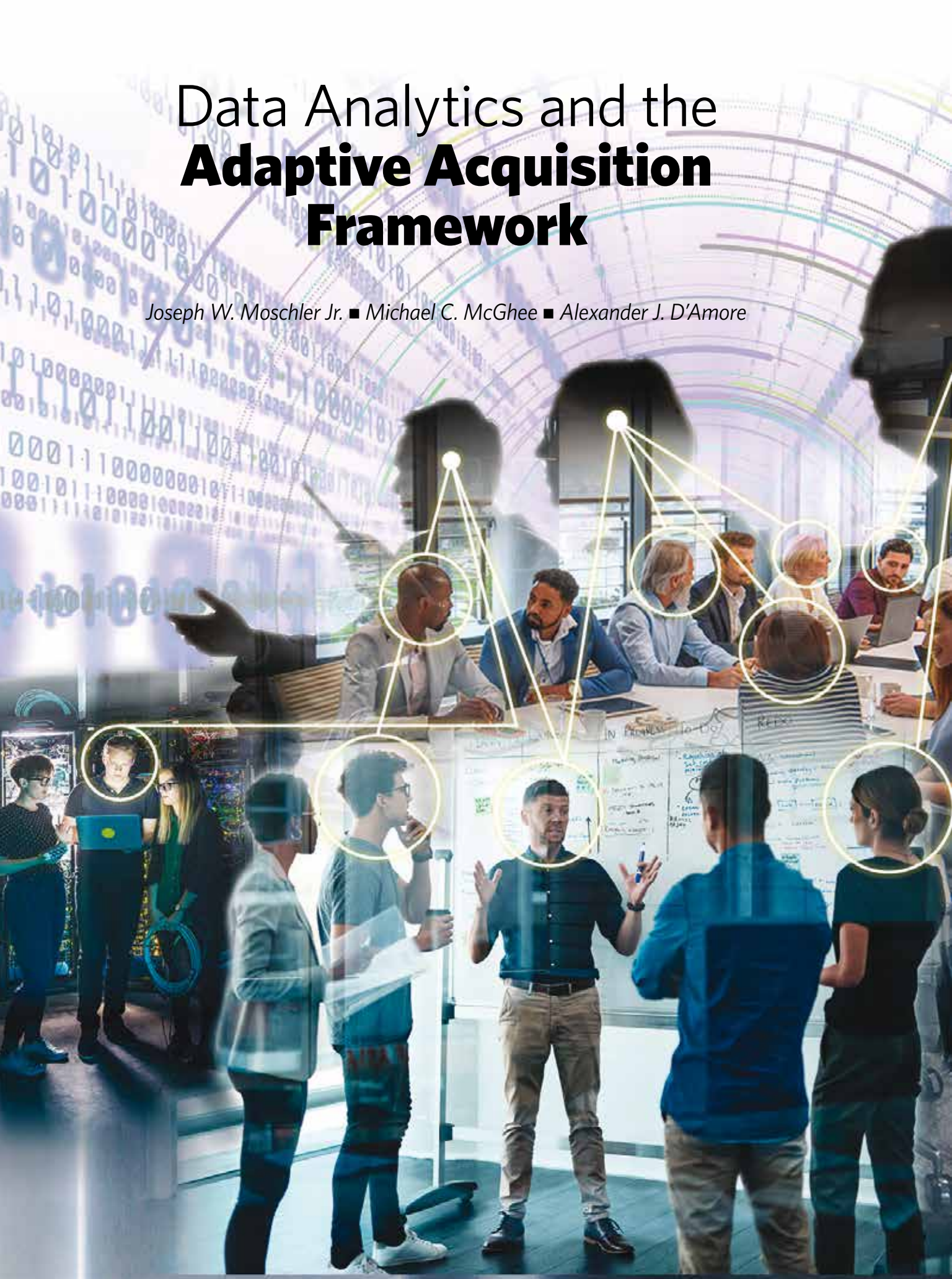
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Data Analytics and the **Adaptive Acquisition Framework**

Joseph W. Moschler Jr. ■ Michael C. McGhee ■ Alexander J. D'Amore





It is a capital mistake to theorize before one has data. (Sherlock Holmes, *A Study in Scarlet*)

—Arthur Conan Doyle

SECTION 913 OF THE 2018 NATIONAL DEFENSE AUTHORIZATION Act (NDAA), calls for increased use of data analytics to improve acquisition outcomes and promote collaboration across military Services and agencies internal and external to DoD.

The commitment to make data a central focus for decision makers is reflected by Stacy Cummings, Principal Deputy Assistant Secretary of Defense, “Acquisition Enablers”:

“Our goal for the near and medium term is to look at data across the Enterprise, to bring it together in a way that will allow us to use advanced analytic capabilities and tools to look at the data where it resides.”

This article discusses how a data-based approach will enable informed decisions on critical matters, leading to the more effective use of the Department of Defense (DoD) budget, and increasing the likelihood of successful acquisition outcomes. Decisions made solely from experience often are prone to human error and bias (halo effect, groupthink, sunk cost fallacy, confirmation bias, and small numbers fallacy, to name a few). Evidence-based decision-making and the use of objective data in particular, are vital to improved agility, risk reduction, and efficiency.

The New Framework

The ongoing “agile” release of the Adaptive Acquisition Framework (AAF) is part of the further empowerment of Program Office personnel.

Intrinsically, DoD acquisition continues its evolution in the quest to deliver the most capable and effective warfighting capabilities to our nation’s military forces. Compelled by the resurgence of threats to this nation’s security and that of our allies, the 2018 U.S. National Defense Strategy (NDS) discusses the urgency and magnitude of these threats and hence the need for the acquisition workforce to deliver required capabilities at a faster pace and in the most cost-effective

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manner possible. To improve our competitive edge, the DoD will pursue three lines of effort:

- Build a more lethal, resilient, agile, and ready Joint Force.
- Strengthen alliances and attract new partners.
- Reform for greater performance and affordability.

A specific instruction to the DoD was to “shed outdated management practices and structures while integrating insights from business innovation.”

Doing more with less is a decades-old refrain for defense acquisition. However, as articulated in the NDS, although affordability is important, speed of delivery is now perhaps of greater importance due to our adversaries’ rapid technological advances.

To that end, the Office of the Under Secretary of Defense for Acquisition and Sustainment (OUSD[A&S]) is developing and refining innovative approaches to delivering capabilities to our warfighters. Their efforts correlate with 14 enabling tenets, all of which are rooted in their organizational Mission Statement, as shown in Table 1.

These tenets serve as a foundation for the recently unveiled Adaptive Acquisition Framework (AAF). The AAF is comprised of six “Pathways” of embarkation. These pathways allow for tailoring, combining, and transitioning between themselves to develop the nominal program framework, with data-driven decisions serving as the inter-connecting crossroads between the pathways.

Business Intelligence “Democratizes” Information, Adding Visibility and Accessibility

“Online Analytical Processing (OLAP.com)” describes business intelligence (BI) as: “[The] technologies, applications and practices for the collection, integration, analysis, and presentation of business information [...] to support better business decision making. Put simply, BI systems are data-driven Decision Support Systems (DSS).”

Proper execution and implementation of analytical tools such as BI will significantly improve programmatic decision-making, as promulgated by Section 913 of the NDAA. Furthermore, the rise of self-service BI, such as visualizations in dashboards, provides the opportunity to share data and insight to all employees throughout the entire organization. BI no longer requires knowledge of advanced programming languages or computer science. Such visibility and accessibility of information provides exciting opportunities to break down data silos in a way that very much supports the AAF initiative. As previously described in the quote by Stacy Cummings, it also promotes collaboration through sharing, reduces program risk by making insight available to inform decisions, and empowers everyone to be a data-driven critical thinker.

Senior DoD officials acknowledge that there is a current lack of data-informed decision making. The acquisition workforce must perform more advanced data analyses, centralize data, and promote its use in decision making

Table 1. Office of the Secretary of Defense (USD[A&S]) Mission Statement
“Enable the Delivery and Sustainment of Secure and Resilient Capabilities to the Warfighter and International Partners Quickly and Cost Effectively”

(A&S) Mission Enabling Tenets	Defense Acquisition System (DAS) Adaptive Acquisition Framework Tenets
Speed Data Driven Enable Service Success Share Best Practices Competitive Advantage Overmatch Ability to Scale and Tailor When Needed Cyber Resiliency Trust	1. Simplify Acquisition Policy: If it is not restricted by law, is ethical, and makes good business sense—do it! 2. Tailor Acquisition Approaches: Develop your acquisition framework from scratch building upon your selected pathway(s). 3. Empower Program Managers: You have greater latitude to exercise critical thinking and implement smart solutions—if you have a clear goal and the necessary competence to achieve it, declare your intent and do it! 4. Conduct Data Driven Analysis: The lifeblood of acquisition success! 5. Actively Manage Risk: Risk identified and mitigated in the most practicable manner. Update risk management plans to reflect reality as the program progresses. 6. Emphasize Sustainment: Programs must be sustainable in their intended environment without degradation to mission capability.

Source: Office of the Secretary of Defense Mission Statement and Enabling Tenets (Derived from: “Defense Acquisition Update” Feb. 20, 2020, Stacy Cummings, Principal Deputy Assistant Secretary of Defense for Acquisition.)

(Briefing: <https://www.youtube.com/watch?v=vJRjYfZMO-I>)

in order to ultimately accelerate and optimize programs' delivery of enhanced capability to warfighters. The need for additional tools is recognized and being worked. One such tool is "ADVANA" (Advanced Analytics), developed by DoD to be "a single authoritative source for audit and business data analytics"; it is currently taking in data from more than 120 DoD systems. It appears promising, but wider application is pending.

DoD Data and Analysis Today

Most existing DoD business systems were established by statutes and policies for reporting instead of analysis. Table 2 lists several of these information systems.

According to Chris Nott (Chief Technology Officer, Government, IBM Europe), although this satisfies regulatory requirements and archives what has happened, it fails to indicate the correlations and causal relationships that would establish why it has happened and predict what will happen. These relationships and predictions require advanced analysis. A culture shift and associated action is

long overdue. Data is not just for reporting compliance to statutes and regulations; it is an asset for decision making and strategizing, enabling and driving decisions at the ever-accelerating "speed of relevance."

Acquisition professionals always have done data analyses—including risk analysis, cost estimation, Test and Evaluation, etc. However, the tools and relevant insights are not sophisticated enough for today's operational environment. On more than one assessment, data analytics within the DoD as a whole lacks sophistication and maturity:

“We benchmarked ourselves, and we had external parties benchmark us, and we uniformly came in at Level One mature, the lowest possible level of maturity.”
—Michael Conlin, DoD Chief Data Officer

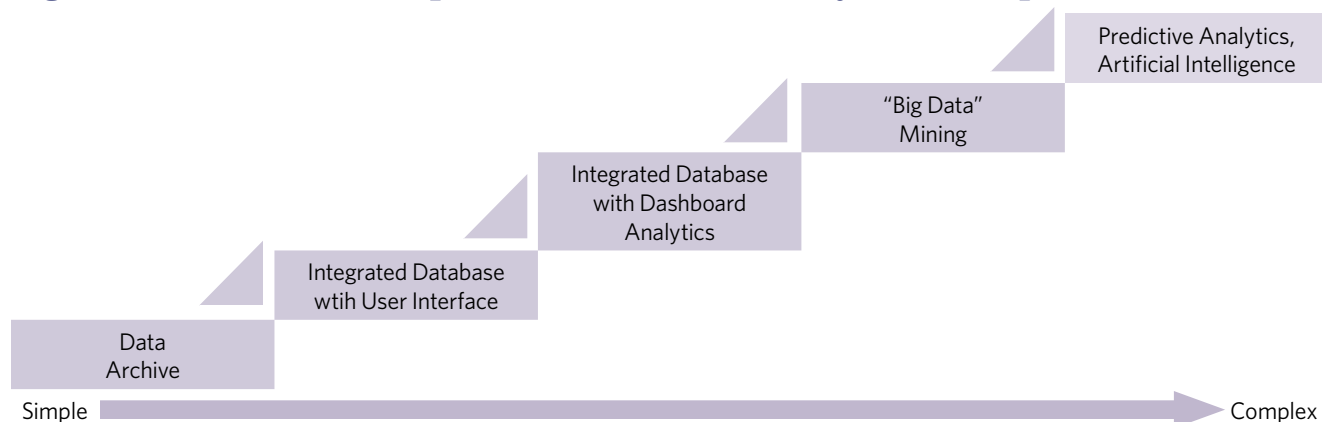
Table 2. Existing DoD Business Systems

System	Functional Business Area
ACQBIZ/AABEP	RDT&E, requirements, budget (finance), contracting, cost/spend (finance), schedule/performance, acquisition oversight, human capital
AIR	Acquisition oversight
Budget Data Site	Budget (finance)
Budget Query Site	Budget (finance)
CADE	Cost and schedule performance
DACIMS	Cost and schedule performance
DAMIR	RDT&E, requirements, budget, contracting, cost spend (finance), schedule/performance, and acquisition oversight
DDRS	Budget (finance)
DRDW	Budget (finance)
EVM-CR	Budget, contracting, cost spend (finance), schedule/performance, and acquisition oversight
KM/DS	Requirements
MOCAS	Contracting
PBIS	Contracting oversight
RDAIS	Requirements, acquisition oversight
SMART	Acquisition oversight
URED	RDT&E, requirements, budget (finance), contracting, schedule, and acquisition oversight

Source: Select DoD Information Systems [Modified from RAND (2017). Access to Acquisition Data and Information in the Department of Defense. Doing Data Right in Weapon System Acquisition, pages 19-20.

Key: ACQBIZ/AABEP=(Acquisition Business) Army Acquisition Business Enterprise Portal; AIR=Acquisition Information Repository; CADE=Cost Assessment Data Enterprise; DACIMS=Defense Acquisition Automated Cost Information Management System; DAMIR=Defense Acquisition Management Information Retrieval System; DDRS=DoD Data Repository System; DRDW=DoD Resources Data Warehouse; EVM-CR=Earned Value Management Central Repository; KM/DS=Knowledge Management/Decision Support; MOCAS=Mechanization of Contract Administration Services; PBIS=Procurement Business Intelligence Service; RDAIS=Research Development and Acquisition Information System (Navy); RDT&E=Research, Development, Test and Evaluation; SMART=Science, Mathematics and Research for Transformation; URED=Unified Research and Engineering Database.

Figure 1. Continuum of Simple to Advanced Data Analysis Techniques



Source: Modified from RAND, Assessing Department of Defense Use of Data Analytics and Enabling Data Management to Improve Acquisition Outcomes, page 36.

Using a survey developed by Gartner Research, RAND rated the DoD at Level 2: "Opportunistic" on a continuum that ranges from Level 1: "Basic" to Level 5: "Transformational." The DoD and many other corporations have significant room to advance in this area. Of the 196 organizations Gartner surveyed, 60 percent rated within the lowest three levels of maturity.

Complexity of "Data Analysis Techniques" within the DoD acquisition community range from simple data archives to predictive analysis (Figure 1). Many DoD systems lack integration of data sources and analytic components.

Now, Defense Acquisition Visibility Environment (DAVE), a database of databases, is the database of choice cited by the AAF. It is structured to allow easy integration by user interface developers who are building capabilities in DAVE, or those who want to align with DAVE's data-first design approach. "DAVE" also is a data governance framework, creating a common way of understanding data.

DoD's acquisition data goals are iterative as represented in Figure 2.

DoD should look at its exemplars to develop other systems to equivalent levels.

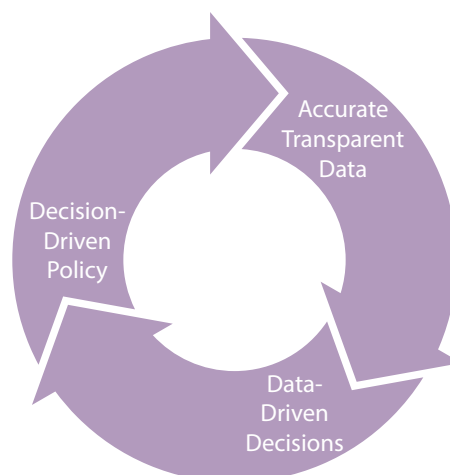
Near-Term Exemplars

The Air Force Project Management Resource Tools (PMRT) and the Army Leader Dashboard (ALD) are effective examples of integrated databases with dashboard analytics. PMRT is a robust platform that automatically pulls in data from DoD and Air Force acquisition, finance, contracts, foreign military sales, and logistics systems. In 2018, this tool was enhanced with the integration of the Qlik Sense product, a self-service BI tool. Through its dashboard, users can make sense of the data through visu-

alizations and probe for trends or abnormalities that may influence their program. Dashboards give transparency and accessibility to the data, making it ripe for management interpretation and decision making.

Similarly, the Army is developing its ALD, which will break down silos of data into a centralized source that will give widespread insight from personnel to acquisitions to logistics. PMRT is used by the Army as a prototype for the business management portion of the acquisition data domain. The benefit of dashboards is that they can often update in real-time. Acquisition policies generally only require acquisition data to be disseminated at the time of milestone decisions. However, an automated system will allow data to be available at any time during the program's life cycle, thereby giving decision makers enhanced insight and allow users to perform their jobs more effectively.

Figure 2. DoD Acquisition Data Goals



Source: The authors, based on discussions with USD(A&S) staff.



... the report cited the need for close coordination, and cooperation between data generators, data collectors, and data managers.

Moving Toward Artificial Intelligence

The Fiscal Year 2019 NDAA, Section 238g defines Artificial Intelligence (AI) as “Any artificial system that performs tasks under varying and unpredictable circumstances without significant human oversight, or that can learn from experience and improve performance when exposed to data sets.”

A recent count reveals DoD has more than 3,000 stand-alone business systems. This type of fragmented approach creates information overload. A Knowledge Graph is a tool that stimulates new ideas and identifies previously undetected cause and effect connections. Knowledge Graphs are all around us in the form of personalized interactive experiences (e.g., Amazon, Apple, Google/Youtube), each providing intuitive prompts and recommendations. Imagine applying this same AI deep learning technology to the AAF. ... Are you researching a tough acquisition issue? As you search the AAF, results of searches by other program personnel—including successes, failures, and false starts—will be manifested as well as derived recommendations for your consideration in making data-driven decisions that typically result in goal-directed behaviors.

The kind of technological leap we are talking about was greatly accelerated by a match of “Go” (an ancient abstract strategy board game for two players, in which the aim is to surround more territory than the opponent with small black or white disks). In his book, *AI Super-Powers*, Kai Fu Lee describes when Google’s DeepMind “AlphaGo Master” computer program beat Ke Jie, the reigning “Go” world champion at the time, it became a “Sputnik” moment for China. As a result, in 2017 China’s central government established a goal to equal the United States in AI theory, technology, and application by 2025 and become the center of global innovation in AI by 2030. So far, they are on target! An example of AI has already been applied in China’s banking sector to aid decisions of whether to approve loans. Even for a loan that takes less than 5 minutes to obtain, the bank’s system can take into account more than 5,000 personal characteristics derived from just a few entries. One consideration is how tentatively you typed your application. Another is how low your phone battery is. Both of these are high-risk indicators.

By design, AAF is in a “perpetual” state of process improvement. The ideal solution captures end-user data via the AAF and other tools or resources similar to the

commercial relational databases alluded to earlier. If we know which “sites” team members are browsing, clicking on, or contributing to, that information can become the basis for knowledge, understanding, and wisdom. And these can take the form of undirected and unsolicited recommendations, cautions, and advice to programs facing similar challenges.

Another RAND study, conducted in response to Section 238(e) of the NDAA of 2019 (“The Department of Defense Posture for Artificial Intelligence”), cited mission support areas, such as acquisition, as prime candidates for consideration as potential “low-hanging fruit” for the implementation of AI; “...focusing on classification and prediction.” It also recognized that AI would have its own challenges. In particular, the report cited the need for close coordination, and cooperation between data generators, data collectors, and data managers. It also recognized that this will introduce inherent vulnerabilities and attack surfaces that will “demand careful consideration.” The study concluded that DoD pursuit of AI at scale by 2025 is realistic but would “require fundamentally transforming DoD’s culture into a data-enabled one that values and uses data to the full potential—a monumental endeavor but one that could enhance efficiencies across the board.”

Fostering a Data-Centric Organization

All of the necessary systems could be in place but they make no difference if they are not being used to their potential. The aforementioned RAND study documents not only analytical capability shortcomings, but decisional issues. Specifically, decisions can be made that are contrary to the available data when there is “a general reluctance to accept unfavorable information.” To place data at the center of business decisions requires a supportive culture and a determination to derive deeper insights.

An example of how best to overcome decisional challenges comes from Alan Mulally, the former CEO of Ford Motors and Mark Fields, Ford’s former “president of the Americas”: When Mulally arrived in 2006, he was confronted with the constant reporting of “Green” on the stoplight charts during project reviews. Prior to the launch of the sport-utility vehicle “Edge” in Canada, Fields reported during a review in the “Taurus Room” that “we’re red on Edge.” In a low-trust environment, the CEO may have scolded the project lead. Instead, Mulally applauded and said “thank you!” He further elaborated that when people speak up they are saving

the company time, energy, and millions of dollars in scrap and rework, not to mention the potential liability associated with a faulty product along with possible damage to the Ford brand. Through this positive reaction to a negative situation, Mulally fostered a culture of information sharing. It was just as important that Fields as the project lead did not dismiss unfavorable data that suggested that there could be an issue with the hydraulic actuator and instead made the unpopular recommendation to delay the launch of Edge. Mulally was happy that Fields provided a realistic assessment from which he could lead more effectively.

Trust and communication, as described in the Ford Edge example, are essential. However, without knowing the context and understanding “why” it happened, the decision maker cannot demonstrate the judgment and “wisdom” to lead projects in the most effective direction. While it is easy to claim to be data driven from merely collecting and presenting data, to truly derive deep levels of meaning depends on analysis. Through analysis, data is processed and organized in five distinctive constructs of increasing value for the decision maker:

- Data: “Stuff!” A collection of letters, numbers, charts, pictures ...
- Information: Contextualized data; the point at which data becomes meaningful and useful.
- Knowledge: Derived from organized information into categories of similarity and relationships (e.g. cause and effect).

- Understanding: Where intelligence meets knowledge; being able to discern why the similarities, relationships or patterns as we know them (obtained through knowledge) are manifested.
- Wisdom: Using our understanding to make intelligent decisions.

These components tend to correlate with the complexity continuum in Figure 1. That is, data archives do nothing more than hold data; databases can provide users basic information; more advanced analytic techniques can provide the “how” things work (knowledge) and “why” a mistake occurred (understanding). While AI is promising, wisdom currently is not as programmable since it involves anticipation of long-term outcomes. Information, knowledge, and understanding can help decision makers do things right; Russell Ackoff explains, “doing the right thing is wisdom...”

By all measures discussed, DoD is low on the scale for data maturity and analytics. The hope and promise of AAF includes a data-centric approach! As acquisition professionals, we need to capture, report, and utilize accurate data, even when that data is less than favorable. These practices will result in data-driven decisions, a more engaged workforce, and improved acquisition outcomes.

The authors can be contacted at Joe.Moschler@dau.edu; Mike.McGhee@dau.edu; and Alex.D'Amore@dau.edu.

To Our Readers

BY THE TIME YOU READ THIS, WE HOPE we will be out of the coronavirus woods and on our way to national recovery—or at least see the beginning of the end of this episode.

Because of a widespread closure of normal government office hours, the final activities in editing, assembling, and illustrating this issue were largely done by teleworking from the respective homes of the staff members. Although an unwelcome event, and one bringing many tragedies in its wake, the coronavirus pandemic has demonstrated the resilience and readiness of the United States Government—including, importantly, the Department of Defense. Lessons learned and adaptations made in this crisis will go far to informing our preparations in the event of any future such event—be it natural or manmade.

We have seen the military respond to a national crisis in a unique way to protect the homeland from the invisible

enemy—a natural contagion. It is hoped that experiencing and surviving this crisis will help us rediscover our fundamental unity and common humanity, as well as perhaps a broader appreciation of national defense in a time of crisis.

We look forward to returning to our normal posts soon. We are interested in hearing more from our readers and our contributors about problems encountered and lessons learned in the field of defense acquisitions. As we move forward with the new Adaptive Acquisition Framework, we hope more members of the workforce will provide examples of how they have been able to use the flexibilities provided to good effect—or of specific issues, if any, confronted in doing so.

Best wishes to all of you out there.

—The editor and staff of Defense Acquisition magazine.

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The Shrinking Private Supplier Base and Acquisition Reform

Gilbert B. Diaz

A KEY ELEMENT IN THE DEFENSE ACQUISITION PROCESS IS MAINTAINING A HEALTHY SUPPLIER base. In today's global economy portions of that base are located overseas and what remains within the Continental United States (CONUS) faces constant pressure from competing, commercial opportunities. Suppliers are in business to make money and if commercial opportunities are more attractive than what the Department of Defense (DoD) offers, suppliers will move toward the commercial opportunities, leaving DoD with fewer alternate suppliers and longer supply chains. Moreover, as the recent problems in China demonstrate, the lack of a healthy CONUS supply base can be a major vulnerability in a crisis. The obvious questions arise—what can DoD do to keep the suppliers it has and can it encourage others to enter the defense market?

A recent initiative from the Office of the Under Secretary of Defense for Acquisition and Sustainment (OUSD [A&S]) is the A&S Strategy Roadmap, drafted with the stated mission to “enable the delivery and sustainment of secure and resilient capabilities to the Warfighter and international partners quickly and cost effectively.” This roadmap includes the goal of building “a safe, secure and resilient defense industrial base (commercial and organic.)” The threat to the supplier base implied by this goal is real, as seen in data showing that the U.S. Defense Industrial Base (DIB) is shrinking in both numbers and revenue. From former Secretary of Defense Les Aspin’s “Last Supper” in 1993, when 51 major defense firms began a decade-long wave of mergers and consolidations that reduced the population to five prime contractors, down to

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the present day as the total number of U.S. defense firms continues shrinking, with the most notable recent mergers being the joining of Orbital ATK and Northrop Grumman, and UTC and Raytheon.

The impact of this DIB shrinkage is felt most significantly in competition. It's axiomatic that a lack of competition drives up procurement costs and dampens innovation, but also makes the DIB vulnerable to single point failures. Unfortunately, this shrinkage in overall numbers also is worsened by the declining overall economic value of the DIB.

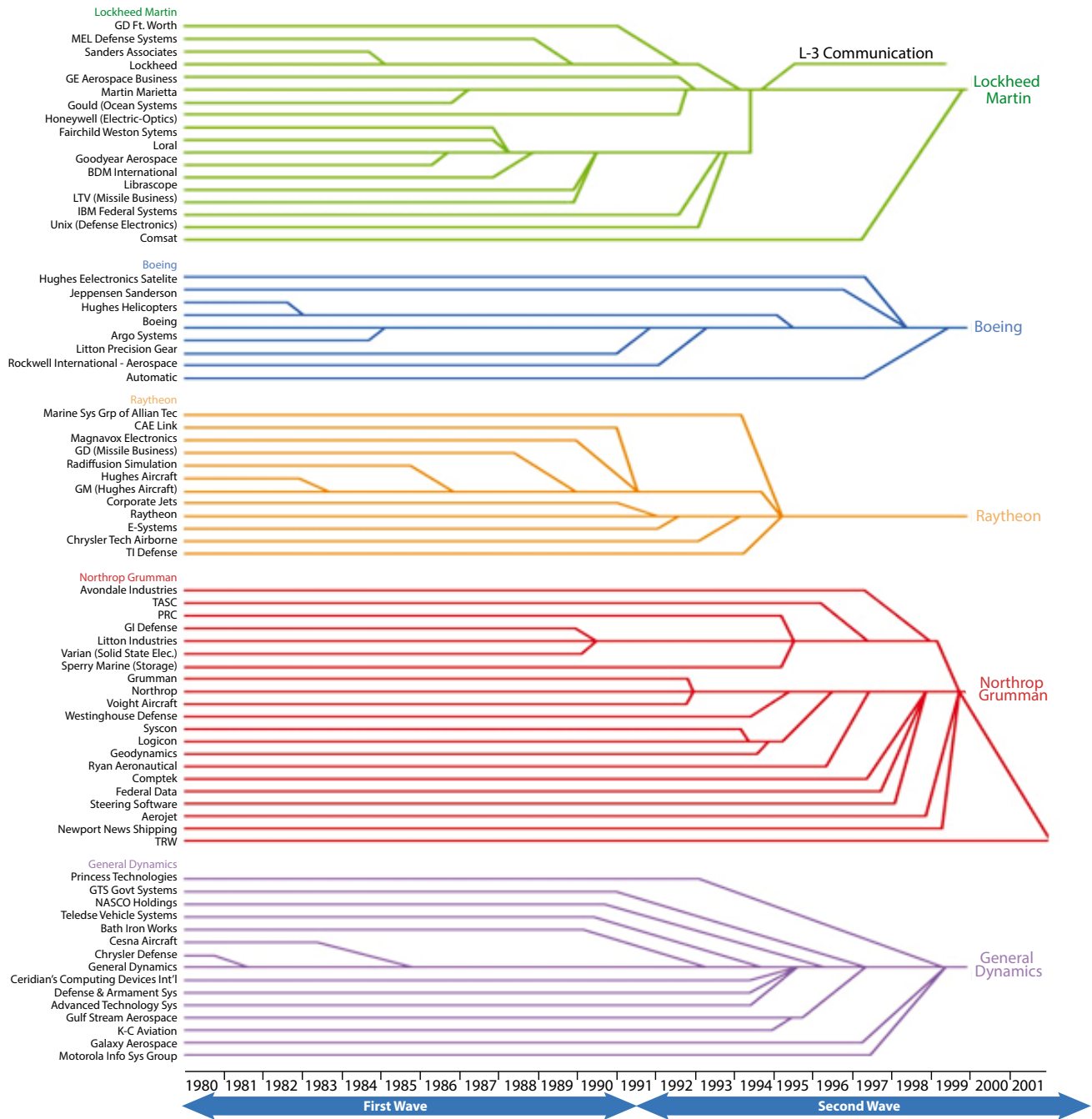
Paradoxically, while overall defense profits are up, the relative value of the defense market as part of the overall U.S. economy has gone down as evidenced by the decline in the number of defense firms included in the top 100 of the Fortune 500 listing, from 15 in 1961 to 4 in 2019. In short, the twin factors of fewer competing firms and a reduction of the defense market position within the overall economy

have combined to weaken the defense supplier base. , The compression of the industrial base heralded by the "Last Supper" and effects of this compression on competition are graphically depicted in the following figures.

Adding to the previously stated factors leading to this weakening of the industrial base, two other significant factors, as highlighted in the media, are global sourcing and a perceived bias on the part of some potential suppliers in favor of seeking commercial work rather than government contracts.

Global sourcing is beyond the scope of this article, but the reasons that firms prefer commercial over government work are readily discernable. It appears that firms are not just choosing to avoid negotiated Federal Acquisition Regulation (FAR) Part 15 government work but that more than a few defense companies are purposefully exiting the government market place to focus exclusively, or at

Figure 1. Merger Compression of DoD's Industrial Supplier Base

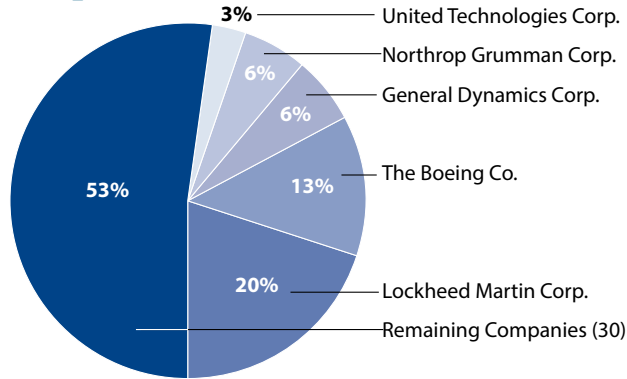


Source: Presidential and Congressional Commission on the Future of the United States Aerospace Industry.

least primarily, on commercial business. Given the many positive aspects of doing business with DoD (multiple opportunities, large budget, prompt payment, etc.) it is important to identify the root causes of this exodus. While it may seem obvious that doing business in the commercial world is easier, government business is good business and understanding why companies voluntarily leave the government market is the first step toward slowing the trend.

In attempting to determine why commercial work is more attractive to many companies, we find that the available information is largely subjective. An internet search of documents related to “doing business with the government” and “government business versus commercial business” reveals a wide variety of articles and publications, going back decades, on why many industrial firms prefer commercial customers. It was easy to discern common themes from these articles, and a list was quickly

Figure 2. Nearly Half of DoD Contract Awards Concentrated Within Five Companies



Source: Government Accountability Office analysis of DoD data.

developed of the most common business views of the government procurement process focusing on issues found in the articles.

The next step was to use this listing as the basis for conversations with several individuals from commercial firms who do business with both government and commercial customers to determine the validity of the information found on-line. People interviewed for this validation included, among others, a small business owner; a vice president from a major, predominantly defense, firm; a vice president from a large firm with a mixed government/commercial portfolio; and, as a sanity check, current members of DoD’s Acquisition Workforce. All collected comments then were collated into the information previously compiled from the Internet to develop a

Table 1. Industry Perceptions of Working With Government Versus Private Sector

View of Government Work	View of Commercial Work
Long procurement lead times with little sense of urgency. No actionable metric measuring time from proposal acceptance to contract award.	Response to market signals is a key to profitability. If one company can’t deliver, another one will.
Excessive regulatory compliance burden: CAS, TINA, FAR, DFAR, ITAR, Title 10, NDAA requirements, etc. Creates confusion, generates process delay, increases program complexity, and adds cost.	Commercial rules and regulations are fewer, less stringent and change less often.
Negative view of contractor profit coupled with regulatory controls. Often appears that government would accept a higher price if contractor profit is measurably lower.	Profit is the life blood of commercial industry. No profit, no business.
Rigid, risk averse acquisition culture. Too many people with the ability to say “no,” but with little responsibility for program success.	CEOs and PMs empowered to make the necessary approvals to speed the process. Risk has a price, but real progress is dependent on the intelligent acceptance of risk.
Competing socioeconomic goals impede the efficiency of the acquisition process. Too many priorities.	Socio-economic factors considered, but not first priority.
Lack of peacetime measure of effectiveness for DoD acquisition process and DoD in general. Hard to measure deterrence until it fails. Money saved goes back to the Treasury.	Any number of business metrics to measure health of the corporation, internally and against competitors.
Lack of clarity on identity of real customer: Warfighter, program manager (PM), or the contracting officer?	After all is said and done, negotiations and contract signing are done with the contracting officer.
Competition for the sake of competition.	Competition is good and can drive down costs, but sometimes has the opposite effect, if applied blindly.
Lots of talk about “should cost” and best value, but too many contracts awarded on the basis of LPTA.	LPTA is a “race to the bottom.”
Aggressive and/or rigid DCMA and DCAA actions without commensurate knowledge of the program acquisition strategy and objectives.	No commercial equivalent.

Source: The author.

Key: CAS=Cost Accounting Standards; CEOs=chief executive officers; DCAA= Defense Contract Audit Agency; DCMA=Defense Contract Management Agency; DFAR=Defense Federal Acquisition Regulation (Supplements); FAR=Federal Acquisition Regulation; ITAR=International Traffic in Arms Regulation; LPTA=Lowest Price Technically Acceptable; NDAA=National Defense Authorization Act; PM=Program Manager; TINA=Truth in Negotiations Act; Title 10=10 U.S. Code regulations on procurement.

Long procurement lead times are driven by a wide variety of factors and are not going away.

list of topics contrasting the perceived government view from the commercial perspective on the same topic. The top 10 industry perceptions are ranked in Table 1.

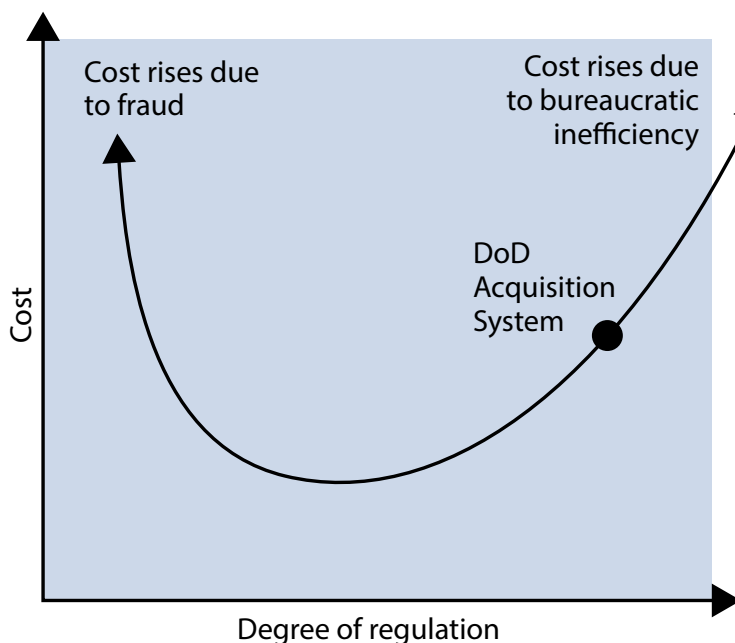
All of the listed issues are well known and all have been identified repeatedly over the last several presidential administrations, but have proven to be defiantly resilient despite numerous reform efforts. To demonstrate the clearly established nature of these issues, almost all were thoroughly detailed in a 1990 Congressional Office of Technical Assessment study titled *Holding the Edge: Maintaining the Defense Technology Base, Volume 2, Appendix A, The DoD Acquisition System*. The many constituencies that the DoD has to satisfy while attempting to meet the Warfighter's needs renders problematic the complete resolution of all these issues. However, the top two on the list, Long Procurement Lead Times and Excessive Regulation, were found to be especially troublesome to businesses and deserve the added attention they are getting from Office of the Secretary of Defense (OSD).

Long procurement lead times are driven by a wide variety of factors and are not going away. Excessive delay adds

cost to any program and keeps the end product—weapon systems—out of the hands of the Warfighter. Additionally, delays negatively impact the operations of prime contractors, frustrate suppliers and small businesses, and invite congressional intervention. Fortunately, the Adaptive Acquisition Framework, especially the Middle Tier of Acquisition outlined in the recently published DoD Instruction (DoDI) 5000.80, provides DoD program managers with additional acquisition pathways that might mitigate these excessive procurement lead times through Rapid Prototyping and Rapid Fielding. While this is not a panacea, it is a start and could cut years out of the process for selected procurements.

The second issue, excessive regulation cost, is visually demonstrated in Figure 3. Regulations are necessary for the governance of any process, especially one with a budget the size of DoD's, and the lack of sufficient regulation leads to increased costs due to fraud. However, any regulation beyond "the knee of the curve" adds cost and delay to the procurement process. Whether any point on the curve can be deemed excessive is a judgment call, but additional regulations do increase cost and contribute to bureaucratic inefficiency.

Figure 3. Cost and Regulatory Intensity



Here again, the problem is recognized, and the reforms targeted by the A&S Strategy roadmap coupled with the extensive restructuring of the entire DoDI 5000 series provide hope for positive change—assuming this effort is backed by requisite legislative action.

In conclusion, while commercial businesses likely will continue to exit the defense market, DoD recognizes the complexities of the issues involved in maintaining a healthy supplier base and is committed to effecting the changes needed to make DoD more attractive to industry. OSD's approach is strategic and goal driven, but the defense procurement process is far too large to change overnight. Les Aspin proved that OSD can drive change in the industrial base, but it remains to be seen what effect the current efforts of OSD will have on the health of this critical base.

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Source: Office of Technology Assessment, 1989.



Effectively Communicating the Acquisition Impact

LTC Kevin P. Shilley, USA

FOR FAR TOO LONG CONTRACTING OFFICERS (KOS) HAVE BEEN ARTICULATING IN A RATHER UNDER-whelming way the impact their acquisition efforts have on enhancing capabilities, mission success, and ultimately supporting the Warfighter. The terms that KOs typically use to frame their support to the Warfighter involve detailing the dollars obligated and number of contract actions performed in support of the Warfighter.

While this approach is used widely within the acquisition community to describe the efforts of contracting professionals, it does little to effectively illustrate the impact of contracting professionals or their teams' contributions to the Warfighter. In order to effectively communicate/articulate their support with key stakeholders outside the acquisition community, contracting professionals need to change their words and approach and develop their message.

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More specifically, they need to transform their message from a technical one to a dialogue that is relatable outside of the acquisition enterprise.

Operationalizing Contracting

An illustration of the need to change how the acquisition professional's value is described is the concept of "operationalizing contracting," which was introduced by Gen. Gustave Perna, Army Materiel Command Commanding General, in 2017. In an online Army Contracting Command article, Perna shared his vision of operationalizing contracting by describing it as "...integrating and synchronizing

ing the information necessary to answer "why" is crucial to further contracting professionals' communications. Equipped with that vital information, development can begin of an effective communications framework to utilize when interacting with the supported commanders and their staffs on requiring activities. Building an effective communications framework begins with fundamentals and requires an understanding of:

- The levels of warfare (*Field Manual [FM] 3-0, Operations*).
- The Phases of the Operation (*FM 3-0*).
- The commander's key tasks and intent.



There is no denying that there is a continued reliance on contracted support by Army units on both the battlefield and home stations to meet their needs.

contracting across the materiel enterprise in order to meet the Army's priorities and the combatant commander's priorities." He adds, "It's not about the number of actions and the dollars obligate ..." but rather "... it's about outcomes for the Soldier on the battlefield and for the Army."

There is very little debate that a complex Base Life Support (BLS) or Logistics Civil Augmentation Program contract, valued at more than \$1 billion, undoubtedly provides a significant capability to a combatant commander across all levels of warfare and warfighting functions. However, if contracting professionals continue to express their value to supported units in terms of dollars and actions, they will fail to illuminate the impact of less complex contracts that also greatly enhance a unit's ability to train, fight, and win at the tactical and operational levels.

Training Environment

In deciding how to effectively communicate to their stakeholders, contracting professionals need to consider several things. One way to build a better framework for their communications to the non-acquisition community is to start with an understanding of the "why, what, and how" associated with the requirement being acquired for the supported unit. Frankly, contracting professionals are well versed in focusing adequate energies and efforts in understanding the what, as well as the how. But how much effort is dedicated to understanding why? Furthermore, are staffs and requirements developers prepared to provide the necessary information about why it is necessary to contract for a requirement or capability? Simply put, the stakeholders are singularly focused on the "what." Hav-

- Operational Contract Support (OCS) (*Joint Publication 4-0, Joint Logistics*).
- The Warfighting functions (*Army Doctrine Publication 3-0, Operations*).

Doctrine is the language of our profession while the acquisition policies and regulations are a dialect. A focus on the use of doctrinal language should extend past the confines of Professional Military Education.

Practical Example

Let's utilize the previously described contract action to help illustrate how to better effectively communicate contracting support in terms that are "operationalized." Remember the BLS contract described earlier as valued at more than \$1 billion? For illustrative purposes, let's assume you are preparing a message for the Task Force (TF) Commander under a combatant commander. The TF staff described the BLS contract support as being necessary due to the Boots On Ground limitations established by the host nation (the why). Some other background information is necessary before we begin to build the communications framework. Let's assume that the audience for the discussion is the TF Commander and, for the purposes of this illustration, he is most interested in the impacts contracted support have in the strategic level of warfare. Operation X is currently in Phase III, and one of the commander's key tasks and intent for the current phase is to deny the enemy safe haven and freedom of movement throughout the Joint Operations Area (JOA). As a contracting professional, you are primarily concerned with the BLS contract

acquisition timeline. How do you communicate the significance within the OCS framework?

Based upon the process described above, a more effective method of describing your organization's impact to the mission might look like this: Regional Contracting Center (RCC)-Operation X utilizes 15 acquisition professionals to provide administrative oversight of the BLS contract in country that provides mission critical contracted support to 10,000 Soldiers across six Camps/Bases. RCC-Operation X's administrative oversight provides mission partners with secure and sustainable facilities and infrastructure that enhance their capability to plan and provide mission command across the JOA. RCC-Operation X's support provides a platform to marshal and mobilize forces rapidly through the use of mission enhancing services such as maintenance, logistical resupply, and health services in order to deny the enemy safe haven and freedom of movement throughout the JOA. This contracted capability provides the commander with the ability to rapidly scale operations as necessary.

Value of Effective Communications

While changing the way contracting professionals express their value to the formation is one aspect of the issue, it is only one part. The other facet that requires some attention is the working relationship that contracting professionals have with requiring activities. There is no denying that there is a continued reliance on contracted support by Army units on both the battlefield and home stations to meet their needs. It is critical that contracting professionals work as closely as possible with supported units from logistics planning to requirements development to help facilitate this reliance on contracted support. A concerted effort from all stakeholders is necessary to more effectively involve contracting professionals in the acquisition process. Increasing the involvement and touch points across staff functions coupled with an expectation of communication from contracting professionals that is grounded in doctrine will help set the conditions for success.

Increasing Opportunities

To develop this critical skill set, it is crucial to create opportunities, and the environment and situations that facilitate the contracting professionals' use of a more effective framework for communicating their support of the Warfighter. The cohesion, trust, and communication our maneuver commanders have with the contracting community can be helped significantly by increasing the contracting professionals' involvement in Warfighter Exercises, Table Top Exercises, training rotations at combat training centers, and logistics planning. Relying on contracting professionals to develop the "language" only when deployed is not an effective training model. We are, however, in luck, because the acquisition support that is provided to our

mission partners at the Camps, Bases, Posts, and Home Stations provides us with an environment that is ripe with opportunities to train.

Conclusion

Finally, a simple example of changing the communications framework contracting professionals use is the pervasive use of the term "customer" when describing the units we support. The use of the term conjures up images of "take a number and have a seat," work hours posted on the door, and long lines at "customer service" sections. This is not the image of a combat enabler that provides a diversity of enhancements, operational flexibility, and reduces vulnerabilities of the Warfighter across all warfighting functions. More appropriate terms that should be used are, for example, requiring activity, mission partners, stakeholders or support unit. Knowing when to use and when not to use certain terms can go a long way to better convey our value to the Warfighter as contracting professionals.

In closing, in order to fully articulate the impact contracting professionals have to the mission and Warfighter, it is critical that: (1) contracting professionals develop a relatable lexicon in describing their impact; (2) increase opportunities and touch points with supported units that facilitate practice in utilizing these skills for contracting professionals; and (3) adopt a simple change such as no longer using the term "customers" as the catalyst for change.

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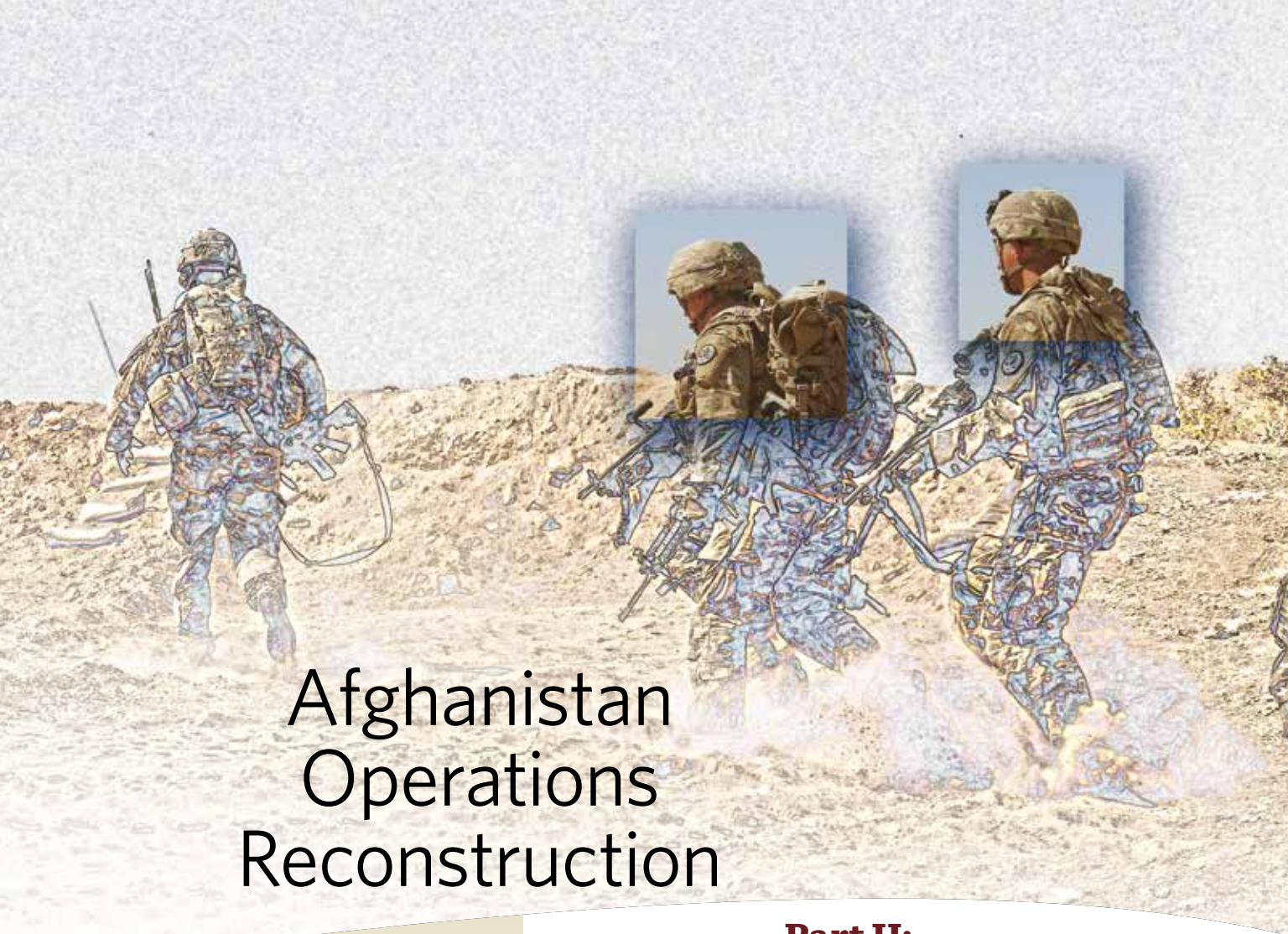
MDAP/MAIS Program Manager Changes

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

Navy/Marine Corps

CAPT D. Scot Searles relieved **CAPT Brian A. Metcalf** as program manager for the LPD 17 San Antonio Class Amphibious Transport Dock Ship Program (PMS 317) on Feb. 10.

Timothy J. Roberts relieved **CAPT D. Scot Searles** as program manager for the Strategic Theater and Sealift Program (PMS 385) on Feb. 17.



Afghanistan Operations Reconstruction

Part II: Capabilities Development and Sustainment

Eugene A. Razzetti

This article, in furtherance of Part I in this series (see the January-February issue of *Defense Acquisition*), focuses on identifying and analyzing a “capability gap” and proposing more practical ways to reduce it or close it completely. We also examine “sustainment” because solving the capability gap without addressing sustainment (of the identified solution) can make the entire effort meaningless.

The section titled “Non-materiel Solutions” includes like findings and conclusions from a study of logistics and resupply in 2006 in the Middle East by the Center for Naval Analyses (CNA), in which the author participated. The fact that findings, conclusions, and recommendations are similar in 2019 to what they were in 2006 reinforces an implied inability of the Department of Defense (DoD) to seek, document, and optimize lessons learned in the Middle East.

A CAPABILITY GAP ADDRESSES THE NEED FOR ADDITIONAL capabilities or for optimizing those that already exist. For our purposes, the proof of an optimized capability is an optimized (and perhaps, a safer) mission.

Gap analysis is a tool for comparing actual performance or results with what was expected or desired. It identifies poor or unacceptable strategies, practices, or technologies—and then (if done properly) recommends corrective action.

The benefits of successful gap analysis include:

- Gaining insight into areas that need improvement

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- Ensuring that program requirements are being met
- Uncovering areas of program weakness
- Providing information to decision makers
- Prioritizing needs and focusing limited resources and energy.

Program managers (PMs) can perform gap analyses for real world or conceptual scenarios. However, performing conceptual gap analyses will likely require assumptions. Whether analyses involve real world or conceptual situations, they need as many real facts and as much real data as you can gather.

Similarly, gap analyses can be strategic and focus on the overall organization and the planning and execution at that level, or they can be tactical, and focus on the day-to-day work of a team or department in furtherance of a specific mission. Since both methods are based on real-world situations, there may be no need to make assumptions. You may have everything that you need.

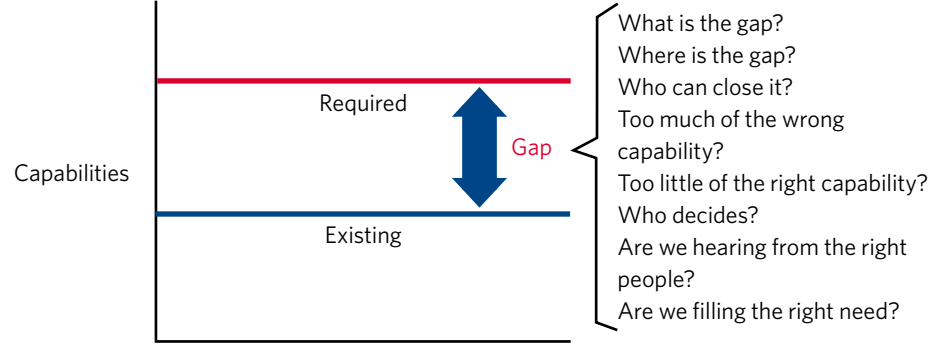
The *Inspector General's (IG's) Report* identified strategic and tactical capability gaps throughout in-theater operations in Afghanistan, stressing the need to determine:

- What is the gap?
- Where is the gap?
- Is the correction too much (i.e., impractical)?
- Is the correction too little (i.e., ineffective)?
- Who decides?
- Is this the right solution for the mission?

Figure 1 describes capability gap analyses as it applies currently to operations in Afghanistan. PMs must focus on what and who identifies the gap, conducts credible gap analyses, and then precisely construct corrective action(s)—all in constant cooperation with U.S. and partner nation Warfighters.

PMs and Warfighters should perform gap analyses frequently—thoroughness, timeliness, and involvement of all players can maximize their effectiveness. Gap analyses

Figure 1. Identifying the Capability Gap



Source: All tables and figures by the author.

can adjust strategies to better fit evolving situations, or to realign organizational processes.

Note: Separate, but inseparable from gap analysis, is risk assessment, which examines the future, while gap analysis examines the present. Both are essential to successful program management in general and logistic resupply in particular; but discussing them in further detail is not in the scope of this article. Please see my previous articles discussing risk assessment and management.

Capability Development—From Gaps to Maps

Capability gaps point to the need to develop additional capabilities, revamping the existing ones, or doing away with redundant ones and the like, in order to optimize the organization or the mission.

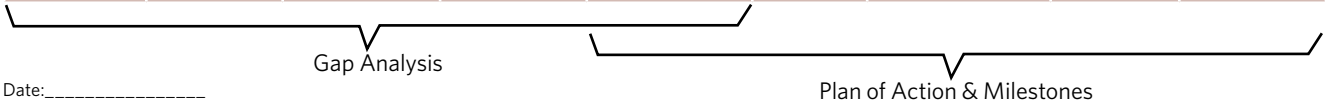
dynamic, actionable, management prioritization tool (i.e., a mini-strategic plan), which can replace more questionable endeavors, such as generating meeting minutes and recurring reports.

Non-Materiel Solutions

Non-materiel solutions are practical, actionable measures that warfighters can employ to increase operational safety and mission performance, without (awaiting) the benefit of new technologies. CNA studied operations in key Middle East strategic ports of debarkation in 2006. It concluded that non-materiel solutions like those listed in Table 2 can make practical, expedient, contributions to mission readiness and efficiency—using what is already available in most cases. The study (in which I participated) went on to recommend incorporating non-materiel solutions into operational planning, concept of operations (CONOPS),

Table 1. Capability Gap Analysis Map, With a Plan of Action and Milestones

Operation	Existing	Required	Gap	Corrective Action	Risk (R/Y/G)	Assigned	Comp. Date	Remarks
1-15	Insufficient MEDEVAC capability	5-10 Simultaneous MEDEVACs	Insufficient trained helo pilots	15 Armored ambulances & drivers		USA/Col. Smith	15 Oct. 2020	10 in-theater now



Date: _____
Prepared by: _____
Approved by: _____

Key: MEDEVAC=medical evacuation.

Configuration management is as essential in information technology (e.g.; computer software and hardware) as it is in civil and industrial engineering (e.g., roads, bridges, canals, dams, and buildings).

and standard operating procedure development, along with training plans—including command post and tabletop exercises and wargames. The study showed further that non-materiel solutions could, in fact, reduce or eliminate the need for those of a materiel or technological nature (e.g., a weapons system or airframe), which often required time, testing, and funding—all with training pipelines of their own.

Table 2 summarizes non-materiel solutions categories of the CNA study, including examples of recommended actions. Many of the areas of the 2006 study have direct correlation and contribution to the current operations in Afghanistan.

If it turns out that a materiel solution (e.g., an enhanced High Mobility Multipurpose Wheeled Vehicle [HMMV]) is the best course of action, then, as these and most studies determine, there must be discipline among the configurations of the systems and equipment to be used in-theater. Specifically, there must be effective configuration management, especially for equipment used in-theater by both U.S. and partner nation forces.

Configuration Management

Configuration management is a system engineering process for establishing and maintaining consistency of a product's performance, functional, and physical attributes with its requirements, and design, and operational information throughout its life. Configuration management processes are used by the military to manage changes throughout the life cycles of complex systems—such as weapons, military vehicles, and information systems. Configuration management is as essential in information technology (e.g.; computer software and hardware) as it is in civil and industrial engineering (e.g., roads, bridges, canals, dams, and buildings).

Configuration Identification consists of setting and maintaining baselines, which define the system or subsystem architecture, components, and any developments at any point in time. It is the basis by which changes to any part of a system are identified, documented, and later tracked through design, development, testing, and final delivery.

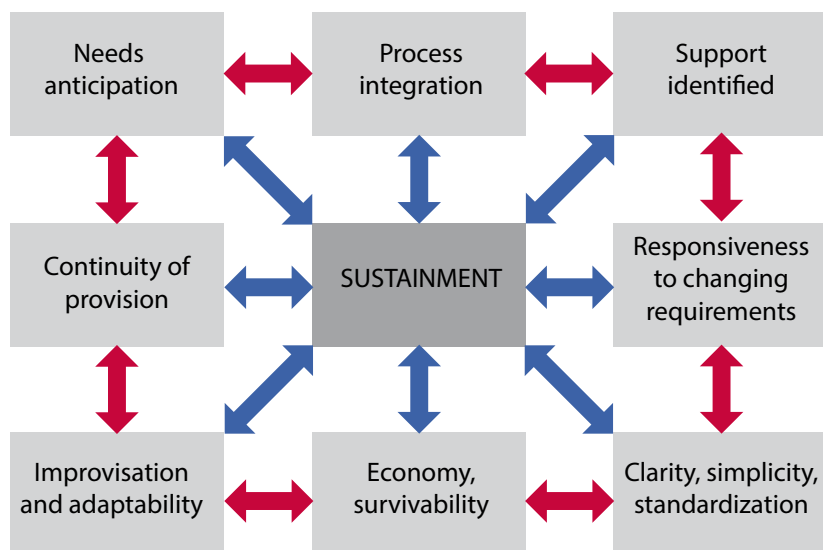
Configuration Verification and Audit describes an independent review of hardware and software for the purpose

Table 2. Non-Materiel Solutions

Area	Non-Materiel Solution
Mission Analysis	Identify all resources, time constraints; CONOPS development/revision
Part Throughput	Early receipt of loadout data; spreadsheet modeling; primary/secondary routing
Medical operations	Practical MEDEVAC procedures; vaccinations; preventive/protective treatment (prophylaxis)
Decontamination plan/prep	Modeling potential CBRNE attacks; protective masks/filters; predictive modeling
Force Protection	Augmentations; defined task organizations; sector/grid systems; Standard operating procedures
Host nation support	Logistics; facilities; food service; laundry; executive agents; battle books; country teams
Risk assessment/minimization	Threat assessment; define unacceptable risk spreadsheet modeling; mitigation
Weather prediction	Meteorological detachments; weather cells; fresh water management; prediction and warning
Training	Seminar wargame/tabletop; software familiarization; pre-deployment unit training; needs analysis; task analysis; emergency responder; firefighting; building/area evacuation
Checklist development	Tactical Operations Center setup; node hardening; personnel/material decontamination

Key: CBRNE=chemical, biological, radiological, nuclear and explosive; CONOPS=concept of operations; MEDEVAC=medical evacuation.

Figure 2. Ongoing, Proactive, Sustainment



The IG Team observed numerous sustainment shortcomings; but, by virtue of their charter, could not initiate corrective action. For that reason, the Army would do well to consider assigning an experienced mid-grade officer (major or lieutenant colonel) to the IG's team for follow-on investigation and assessment of Afghanistan operations. He or she could provide immediate voice/hard copy feedback and expediting to pre-designated officials in the Continental United States. "Action Items" would become "Completed Actions" almost immediately, and without awaiting generation of "after-action" reports and briefings.

Figure 2 describes ongoing, effective, sustainment. Note the constant two-way communication. Without that continuous flow—involving all players and users—there can be no ongoing sustainment.

of assessing compliance with established performance requirements, commercial and appropriate military standards, and functional, allocated, and product baselines. Configuration audits verify that the system and subsystem configuration documentation comply with the functional and physical performance characteristics before acceptance into an architectural baseline.

The IG's Report contained numerous instances wherein a robust program of configuration management would have added measurably to equipment compatibility and mission effectiveness.

Sustainment—Don't Leave Home Without It

The Dictionary of Military and Associated Terms defines sustainment as "the provision of personnel, logistic, and other support required to maintain and prolong operations or combat until successful accomplishment or revision of the mission or the national objective."

Sustainment is essential to maintaining combat power, enabling strategic and operational reach, and providing U.S. forces with endurance. The principles of logistics are the same as the principles of sustainment, and while these principles are independent, they are also interrelated.

A crucial sustainment principle, responsiveness, is the ability to react to changing requirements, to meet needs, and to maintain support. Responsive sustainment means that commanders maintain operational focus and pressure, set the tempo of operations to prevent exhaustion, replace ineffective units, and extend operational reach.

Summary

Failure to address capability and sustainment and include real-time, actionable, reach-back remains a clear and present deficiency in Afghanistan; and clear and present deficiencies create clear and present dangers.

Capability gaps must be minimized, and sustainment of the optimum solutions (whether materiel and non-materiel) must be maximized. The fact that supply chain shortcomings in the Middle East persist despite years of opportunity to streamline and fine tune, suggests that they need greater visibility in real-time and not just in after-action reports. Again, the DoD would do well to consider augmenting the IG's staff with a liaison officer/expediter, who can both cut through and report "red tape."

The talented, energetic, and dedicated professionals of the IG's staff can provide their findings—fully documented. They can brief in any venue and both seek and relish every opportunity to impart their valuable body of knowledge. They cannot, however, correct capability gaps and sustainment failings in the supply chain, reverse stagnating tendencies, or streamline burdensome and ineffective liaison, communication, and reach-back procedures that endanger the warfighter. That ball is in our court.

Check out the I.G. report at: <https://www.sigar.mil/pdf/lessonslearned/SIGAR-19-39-LL.pdf> and build your worklist. The warfighters in Afghanistan (like my grand-nephew) would really appreciate it.

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The Marines and the Future of Unmanned Systems

James Landreth ■ Capt. Shelby A. Ochs, USMC ■ Capt. Matthew Riloff, USMC

THE UNITED STATES HAS TWO DECADES OF EXPERIENCE OPERATING UNMANNED SYSTEMS (UXS) IN post-Sept. 11, 2001, campaigns—but these deployments occurred in theaters where U.S. forces could rapidly establish uncontested air space and local maritime superiority. Current trends indicate that future conflicts will require U.S. forces to operate in contested or denied environments.

Iran's targeting of the U.S. high-altitude RQ-4A unmanned aerial system (UAS), *USS Boxer*, for destruction of an Iranian UAS within its Naval Exclusion Zone, and Houthi asymmetric UAS attacks across the Arabian Peninsula typify the range of UxS technologies in the field today. The threat of adversary UxS technology multiplies when assessing the capabilities of near-peer competitors like Russia and China.

As the nation's naval expeditionary force-in-readiness, the U.S. Marine Corps (USMC) must understand how UxS are changing the operational environment prior to entering the next engagement. Because the USMC will likely be first-to-fight, Marines must prepare for two major differences from today's environment: operating in contested domains and

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the large-scale presence of adversary UxS in all domains. Following the guidance of *Marine Corps Vision and Strategy 2025*, the USMC must align strategic imperatives with its ends, ways, and means to be prepared for conflict in the 2020s and beyond. Marines must be trained, equipped, and authorized to counter adversary UxS and employ their own integrated UxS in order to win our nation's wars.

Building on the NDS (Strategic Imperatives)

The 2018 National Defense Strategy (NDS) prioritized preparation for Great Power Competition (GPC) with near-peer competitors. As a second-tier priority, the NDS acknowledges that combating non-state actors and extremist groups will remain a constant challenge for the defense enterprise. The official *Marine Corps Vision and Strategy 2025*'s imperative of deterring major war nests perfectly within this framework. As former USMC Commandant and Director of Operations for the Joint Chiefs Gen. James T. Conway correctly stated, "We must be a two-fisted fighter—able to destroy enemy formations with our scalable air-ground-logistics teams in major contingencies, but equally able to employ our hard-earned irregular warfare skills honed over decades of conflict."

The selection of Gen. David H. Berger as the new USMC Commandant will accelerate the USMC's evolution to a 21st-century force. His experience as Deputy Commandant, Combat Development and Integration, and Commanding General of the Marine Corps Combat Development Command highlight the Pentagon's recognition that the USMC must aggressively pursue its modernization and evolution for combat in the 2020s and beyond. As outlined in the *Marine Corps Operating Concept*, 21st-century Marines must "avoid linear, sequential and phased approaches to operations and blend maneuver warfare and combined arms to generate the combat power needed for simultaneity of action in a full range of missions."

Berger's *Commandant's Planning Guidance* assigns force redesign as his top priority. Central to this redesign is developing the concept for Expeditionary Advance Base Operations (EABO), which enables forward naval operations within an adversary's intelligence, surveillance, collection, and weapons ranges. Mature EABO will be critical in the contested domains of the GPC where UxS will be ubiquitous, and the USMC must employ robust methods of certifying readiness for the necessary maneuver and combined arms employment to validate EABO performance. In order to effectively simulate adversary use of UxS at deployment-level certification exercises, the USMC must equip "Red Battalions" with multi-domain UxS and release them from typical USMC doctrine or rules of engagement (ROE). Unleashed from ROE or scripted operating boxes, eager Red Battalions will identify vulnerabilities and

develop unforeseen effects that will inspire new EABO doctrine for offense and defense. Robust and accurate adversary simulation is the only way to ensure that there is EABO resilience against both near-peer competitors like China and non-state actors like the Houthis.

Integration (Ends, Ways)

In order to achieve the vision of sustainable expeditionary operations and joint sea basing capabilities, the USMC must effectively integrate UxS within EABO and with Sister Services' doctrine. Current doctrine effectively de-conflicts UxS operations, but further growth is needed to effectively integrate the cross-domain effects achievable with UxS. To clarify, de-confliction prevents mutual interference of platforms, but can result in needless coverage gaps while assets enter and exit an area of operations. In contrast, effective integration results in force multiplying enhancements to command and control, maneuver and combined arms effects.

UxS integration requires specific attention because UxS by nature yield cross-domain effects. For example, individual UAS platforms can be used to collect intelligence, exploit the electromagnetic spectrum (EMS), launch cyber effects, and coordinate kinetic fires. Thus, even though UAS operate within the air domain, they yield effects in multiple domains. Similarly, unmanned ground and maritime systems can employ cross-domain effects. To effectively integrate UxS, the USMC must define the lowest common denominator for integration of cross-domain effects. In order that maneuver formations will be better postured for hybrid threats in complex environments, integration nodes should be defined by an echelon's certified capability rather than a specified echelon of command. As an example, any maneuver formation with an assigned Air Officer could serve as an integration node as opposed to requiring Battalion-level integration. This builds upon existing USMC efforts to increase organizational agility by supplying the Corps with many qualified UxS operators.

In order to successfully evolve from de-confliction to integration, the USMC must first lead joint, multinational, and interagency activities in the refinement of operations orders (OPORDs). Specifically, tasking and coordinating instructions to UxS units in OPORDs must be consistent with the given Concept of Operations (CONOPS). Because of the cross-domain nature of UxS, if planners fail to clarify tasking statements or coordinating instructions, combat teams will be less able to use UxS to the full potential. All echelons of command within the USMC can take the initiative to coordinate effects. But coordinating across domains from remote positions in contested environments likely will exceed the difficulty of meeting the objective by more traditional though less efficient and higher-risk means. Moreover, USMC doctrine must effectively define the role

Because the USMC expects to operate in a contested environment beyond the safety of the launching naval platform, it is imperative that Marines be equipped with mobile counter-UxS capabilities.

of UxS in maneuver warfare and combined arms scenarios. Sound doctrine will enable improved execution of OPORDs despite the fog, friction, and uncertainty of contested environments. These two areas of improvement must be addressed in the USMC redesign or the UxS are unlikely to be integrated to full capability.

In addition to refining its own doctrine, the USMC must collaborate with the other military Services and with the U.S. interagency and coalition partners to ensure the interoperability of expeditionary operations. For example, the USMC must ensure its doctrine integrates with U.S. Navy (USN) organizations like Commander Submarine Development Squadron-5 (COMSUBDEVRON-5), which serves as the tactical development authority for the Navy's unmanned underwater systems. While the USMC and COMSUBDEVRON-5 have different UxS fleets, there will be significant mission overlap in GPC scenarios that require amphibious forces in littoral seas. Once the Sea Services effectively integrate their UxS fleets, this model can serve as a template for joint, interagency, and combined activities.

Beyond OPORD development, the USMC and other Services must coordinate UxS policy with domestic regulatory bodies like the Federal Aviation Administration and equivalent agencies. EMS use must be coordinated with the Federal Communications Commission, National Telecommunications and Information Administration, and host-nation equivalents. Effective coordination will be critical in ensuring the safe conduct of civilian air traffic and avoiding interference with nonmilitary portions of the EMS. While this coordination must occur at very senior levels of government, leadership in this arena offers the USMC an opportunity to contribute to homeland defense-in-depth and increase cooperative relationships with international partners.

Acquisitions (Ways, Means)

All Services within the Joint Force are aggressively pursuing UxS. The Assistant Secretary of the Navy for Research, Development and Acquisition (ASN RDA) works across the USN and USMC Program Executive Offices (PEOs) to promote the development and integration of UxS into the distributed force of the future. Because of the USMC's naval expeditionary function and the cross-domain nature of UxS, it is imperative that all classes of UxS operate within a common policy framework and architecture. A

common policy framework and architecture will allow effective integration with the existing U.S. conventional power and restore the full margin of overmatch. ASN RDA should define an architecture that is a government off-the-shelf (GOTS) solution with tiered requirements for equipment interface for the different classes of UxS. By defining a GOTS architecture and common interface requirements, ASN RDA will align the efforts of the significant number of PEOs providing UxS and yield better buying power for the Sea Services. Moreover, GOTS architecture and common interfaces will better enable holistic integration of cross-domain UxS into maneuver formation tasking and coordination instructions.

UxS technology continues to advance rapidly, but it is important to realize the technology for most conceivable maneuver or combined arms scenarios already exists in some form. The Pentagon employs the Joint Capabilities Integration Development System (JCIDS) to prioritize and effectively integrate acquisitions for the Joint Force. On UxS, the key JCIDS challenge for the ASN RDA and the USMC acquisition workforce is to ensure that the doctrine, organization, training, materiel, leadership, education, personnel, and facilities (DOTmLPEF) framework evolves as fast as the acquisition workforce is providing the needed tools.

UAS use cases clearly expose the tension between existing policy, technological capability, and unit potential. As an example, current policy and host-nation regulations require UAS operators certified via the Basic Unmanned Qualification (BUQ) program to maintain tactical control of UAS during deployment. While robust certification programs are essential, the BUQ program is nested within a policy framework modeled after the manned aviation safety concepts. The well validated air safety concepts are critical for safeguarding high-value platforms that protect the intakes of jet aircraft, but significantly limit the lethality of small maneuver formations. From a capability perspective, Lockheed Martin's Stalker XE UAS illustrates this point. The Stalker advertises a range of up to 200 kilometers (km). Within a platoon-size formation, a junior Marine could meet the BUQ requirements to be the primary operator of this technology and raise the combat efficiency of the unit. However, the capability provided by the Stalker enables the junior Marine to far exceed the cross-domain effects delegated in the past to any Warfighter of comparable rank. As a result, operational control of such UxS assets

typically are retained at organization levels consistent with legacy DOTmLPF versus devolving responsibility to the lowest effective level. In order to achieve the devolution of responsibility necessary for EABO, the USMC's policy, technology, and planning coordination bodies must identify new methods to metabolize this risk in a way that does not unnecessarily restrict the capabilities of maneuver formations equipped with UxS.

The critical need for operational commanders, Services, and the acquisition workforce to rapidly optimize new acquisitions with the DOTmLPF framework is highlighted by the fact that adversary nations and non-state actors possess similar capabilities and act with little restraint. For example, the Iranian Revolutionary Guard Corps is supplying the Houthis in Yemen with Qasef-1 UAS that have an effective range of 160 kilometers. The Houthis are successfully employing these UAS against civilian infrastructure across the Arabian Peninsula. Similarly, Russian military operatives are embedded with Syrian regime forces and prosecuting traditional no-strike targets such as hospitals. As the USMC Red Battalion exercises simulate the conditions for EABO against adversaries that lack strict policy frameworks or concern for collateral damage, the stream of lessons learned will present an opportunity for the USMC to lead in the JCIDS process.

Beyond fielding technologies with common architectures and developing agile policy, it is essential that the USMC UxS physically nest with launching naval platforms in order to reinforce naval relationships and secure effective contribution to amphibious force levels. In order to make sure that acquisition programs integrate across the Sea Services, ASN RDA should implement a recurring UxS review similar to the Joint Requirements Oversight Council. The "UxS Requirements Oversight Council" must require that the Sea Service UxS programs define compatibility with launching naval platforms as a key measure of effectiveness. Common architecture and interface requirements will provide a sound foundation for this measure of effectiveness.

As an illustration, the USMC has fielded a number of Light Marine Air Defense Integrated System (LMADIS), manufactured by Ascent Vision Technologies (AVT). In July 2019, the LMADIS was used from the deck of an amphibious ship to provide counter-UAS capability against an Iranian drone that was violating the vessel's Naval Exclusion Zone. The LMADIS is mounted on the MRZR all-terrain vehicle, so it is physically mobile on the flight deck of a large amphibious ship. However, the MRZR will not be equally portable on other large naval combatants such as Cruisers or Destroyers. The USMC AWF should assess if the interoperability of the LMADIS and similar systems

could be improved from all physical, architectural and EMS aspects in order to increase its lethality.

Because the USMC expects to operate in a contested environment beyond the safety of the launching naval platform, it is imperative that Marines be equipped with mobile counter-UxS capabilities. These capabilities must integrate within the USMC's doctrine governing the EMS, targeting and domain awareness. In parallel with resolving the DOTmLPF challenges of UxS and counter-UxS employment, the USMC must encourage the operators, industry, and the AWF to innovate methods by which the critical assemblies within LMADIS-like technologies can be brought to bear in other EABO scenarios. For example, LMADIS uses AVT's optics package for multi-sensor imaging. In its latest product iterations, AVT decoupled the optics package from the LMADIS, and is producing variants that can be used for a range of applications from man-portable activities to protection of critical infrastructure. By encouraging production of UxS and counter-UxS capabilities, the commandant's redesign will not be a reorganization of legacy equipment and personnel but instead a rebirth into the naval expeditionary force-in-readiness that the 2020s and beyond will require.

Conclusion

In his book, *Team of Teams: New Rules of Engagement for a Complex World*, retired U.S. Army Gen. Stanley A. McChrystal recounted the reinvention of the Joint Special Operations Task Force into an agile organization that could evolve as fast as the insurgent enemy. "We had to tear down familiar organizational structures and rebuild them along completely different lines, swapping our sturdy architecture for organic fluidity, because it was the only way to confront a rising tide of complex threats," he wrote. McChrystal's principles directly apply to the USMC's integration of UxS into its preparation for 21st-century security challenges.

The Marine Corps Vision and Strategy 2025 aligns strategic imperatives with ends, ways and means, and the USMC must constantly update this guidance with the evolving realities of adversary UxS. Berger's redesign of the USMC must be able to operate in contested domains with ubiquitous adversary UxS in all domains. In order to meet the expectations as the nation's naval expeditionary force-in-readiness, the commandant's EABO framework must be able to effectively counter adversary UxS. And Marines must be trained, equipped, and authorized to employ their own integrated UxS within scalable maneuver formations. With these evolutionary leaps, the Corps will be prepared to win our nation's wars in the 2020s and beyond.

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DEFENSE
ACQUISITION

Why Isn't **All Information Technology** a Matter of National Security?

Michael R. Cirillo

IT HAS BEEN MORE THAN TWO DECADES SINCE the terms Information Technology (IT) and Chief Information Officer (CIO) were created and one decade since “cyberspace” was established. Although the creation of cyberspace fundamentally operationalized IT and gave IT a warfighting context, the law has not kept pace. Congress also has not fundamentally operationalized the definition of IT, how we employ IT, or how CIOs function. Attempts by the Department of Defense (DoD) to affect the application of statute have only resulted in ineffective IT acquisition, cumbersome and bifurcated IT processes, and a confused paradigm for how and why we employ IT. As a nation, we have yet to come to terms with our vestigial administrative and business-like bureaucracy that prevents us from seeing IT through an operational lens, causes poor IT governance, hampers IT innovation and, most importantly, prevents the strengthening of national security.

To evolve, Congress should consider making the following changes in law:

- Enact a National Information Technology Act (NITA).
- Create an IT-type of funding that functions inside the annual federal budget cycle and update the Federal Acquisition Regulation (FAR).
- Operationalize CIOs.



- Direct centralized IT acquisition against a known IT baseline.

Background

Federal law defines two uses of IT: National Security Systems (NSS) and Defense Business Systems (DBS). An NSS is integral to weapon systems, or used for intelligence and cryptologic activities or military command and control. A DBS is used for routine administrative and business applications. Although both definitions have undergone changes since the 1990s, to date we continue to experience strategic IT acquisition and procurement latency, an ungoverned IT procurement process, muddled operational necessities based mainly on personal IT convenience and needlessly differentiated cybersecurity.

These definitions also fail to consider that adversaries who use cyberspace against the United States seek to exploit

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such definitional gaps in our employment of IT. Because cyberspace includes IT, both NSSs and DBSs are innately part of the same cyberspace and connect with each other. Our current mindset does not reflect the logic of this point. We remain convinced through evidence of our actions that commercial-off-the-shelf (COTS) IT is solely what we buy from big-box retailers. This consumeristic view of IT acquisition does not align with how we view acquisition of howitzers, submarines, rifles, and other military equipment. Unless we change how we view IT and begin demonstrating much greater seriousness regarding IT, the decades of compromises, data losses, stolen privacy and intellectual property, and countless IT and network failures will continue to negatively impact national security and remain a plague on the collective nature for how IT is used by our nation.

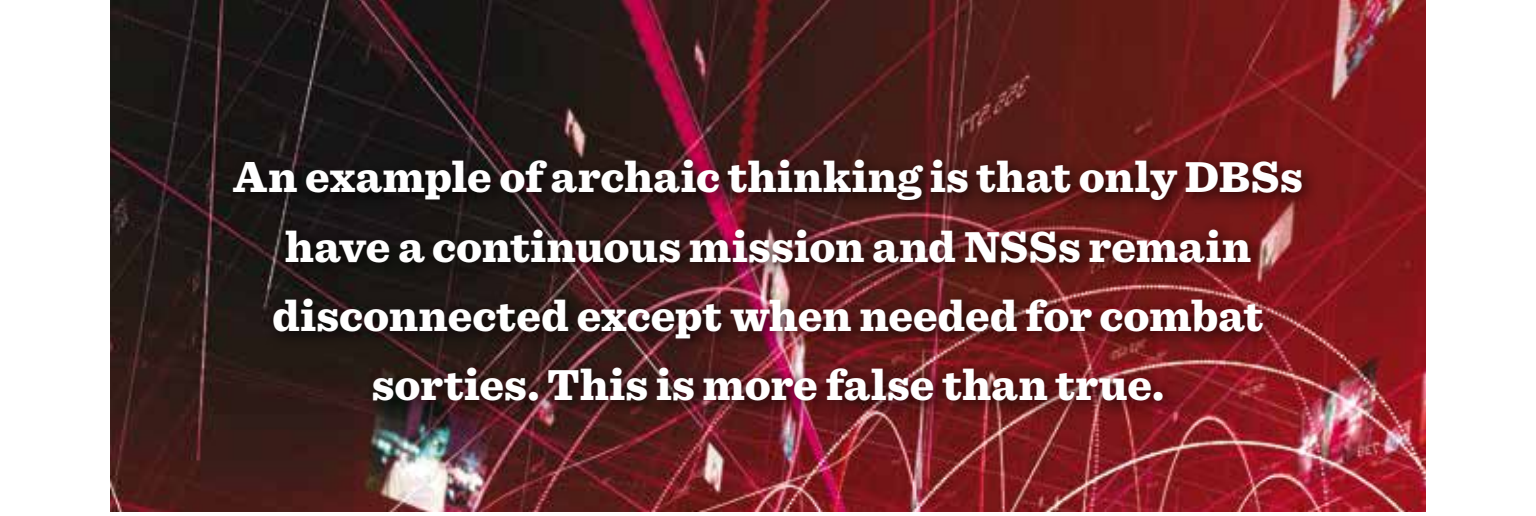
By our continued use of two definitions, we will not prevent our adversaries from taking advantage of this gap in our

perspective and processes. Current statutory and regulatory guidance cannot clearly answer questions such as:

- Is a laptop cyber or IT?
- Is IT the technology and cyber the purpose?
- How does IT's cyber purpose relate to IT's uses?
- Can IT possess multiple uses? For example, can I use NSS software on a DBS laptop?
- Can I access an NSS while using a DBS?

The Changed Landscape

In 1997, when the Clinger-Cohen Act (CCA) was enacted, having two uses for IT made sense. However, we were supposed to change our perspective when cyberspace was created circa 2009-2010. The cyberspace perspective is based on the recognition that the hyper-connected nature of information today means that adversaries, actors, entities, and others can use IT against us, that cyberspace is a contested domain like land or sea, and that harm is indeed occurring to us through the



An example of archaic thinking is that only DBSs have a continuous mission and NSSs remain disconnected except when needed for combat sorties. This is more false than true.

employment of IT. In other words, cyberspace is supposed to help us understand that there is a malicious way to look at things and that using the Internet and the World Wide Web requires security, protections, verified trust, and defenses in a way not conceived of when the CCA was enacted. However, 10 years of cyber later, we have yet to adequately leverage the cyberspace way of thinking. Perhaps we have within the cyber operations community, but certainly not in general or specifically with CIO management and administrative processes.

CCA increased nonoperational and administrative IT oversight, but the creation of cyberspace as a warfighting domain should have changed this IT paradigm to one where the U.S. Government no longer views IT through an administrative lens. Despite Congress' intent, cyber-attacks have grown exponentially and computer-based viruses began negatively affecting both NSS and DBS. However, the impacts never struck a chord because they were considered an isolated event and an administrative problem.

In the late 2000s, the president and Congress slowly began to recognize threats from foreign and domestic actors seeking and gaining access into our increasingly interconnected NSS and DBS. In 2011, the DoD released its "Strategy for Operating in 'Cyberspace,'" establishing cyberspace as an operational domain. However, this strategy failed to intercede with the CIO's titled authorities, nor did it operationalize IT within a cohesive national security construct. U.S. government and corporate intellectual property remain easily removable from IT systems and—due to security updates like the 2017 patching scramble to address the Wannacry ransomware attack—we see just how far-reaching and operationally unconstrained IT's life cycle is.

The CIO's administrative and management authorities remain positioned above the command and control of cyberspace. A conflict exists between the CIO's administrative and business authorities and the operational capabilities needed to function within a cyberspace integrated with other domains, many of which also use IT. This conflict exists because our laws and regulations remain funda-

mentally unaffected by the adversarial nature of competing, operating, and conducting warfighting in cyberspace. This conflict has had negative impacts on government and industry IT procurement and sustainment efforts, as evidenced by DBS and NSS compromises at federal government organizations such as the Internal Revenue Service, Office of Personnel Management, and Joint Chiefs of Staff. Furthermore, national cyber operations such as Moonlight Maze and Eligible Receiver provided lessons that were misapplied or ignored.

Archaic Thinking

In a world increasingly connected to cyberspace, we strive to evolve beyond archaic thinking and accept that IT now has a singular use relative to cyberspace. In order to remain secure amid technological improvements and rapidly changing cyber threats, all IT requires the same volume of security updates and performance upgrades.

An example of archaic thinking is that only DBSs have a continuous mission and NSSs remain disconnected except when needed for combat sorties. This is more false than true. In fact, DBSs use layered and increasingly cloud-based technology that provides different availability qualities. NSSs are increasingly connected so they can remain securely patched and ready for operations and training. Also, within cyberspace, NSSs and DBSs exist and function on an environmental scale from robust and stable to austere and unpredictable. For example, if you take a garrison laptop into combat, operate chat sessions for an operation then reach back into garrison to check payroll, you are conducting both NSS and DBS functions. In that situation, how the IT is used statutorily distinguishable as either an NSS or DBS.

We must understand the critical consequences between loss of life and business process delays. How do we compare the lost value and risk of the Office of Personal Management's data breach, when more than 20 million privacy records were stolen by foreign cyber actors, to the potential loss of life from an adversary breaching a command and control weapon system during a combat operation and reducing the number of identified enemy armored

vehicles? When measuring effectiveness, an NSS' return on investment is generally viewed through its lethality and survivability, while a DBS' return on investment (ROI) is measured through its cost benefits. With an evolved single IT use, the ROI for IT should be based on the premise of national security and independent of tactical meanings. It should be understood that acquired COTS IT, by definition, begins its life cycle already in need of sustainment.

Often, DBSs are not pure COTS and are often modified, while NSSs are increasingly tailored or pure COTS. Also, funding for IT sustainment is managed differently for NSSs and DBSs. Life-cycle funding for all IT does not include funding for patching, industry-implemented updates and unknown cyber vulnerabilities. This full life-cycle funding must be available up front; otherwise, we will continue to express feckless concern that cybersecurity gaps are not fixed immediately.

Evolved IT Use

Across decades, incremental reform of IT acquisition has occurred with greater or lesser success. What has not occurred is an evolutionary change based upon a national security imperative. The following changes are evolutionary in nature and provide a new paradigm, identify funding changes, and foster the requisite national security and operational mindset foisted upon cyberspace by adversaries and actors.

Congress enacts a National Information Technology Act (NITA). Congress should enact the NITA, which designates all IT used in, by, or for federal, state, and local government—or by any public or private entity conducting business with the U.S. government—as NIT. NITA defines NIT as a matter of national security, a potential instrument of national power requiring strategic resourcing, identically applied cybersecurity requirements and identification of “life-of-the-IT” costs for secure use. NITA fundamentally elevates the importance, relevance, and caution required for IT acquisition, operation, and sustainment.

NITA synchronizes our view of all IT as NIT, directly affected by, in and through the interconnected nature of cyberspace. All IT in the United States is nationally synchronized in cyberspace. Thinking strategically, since IT makes up the vast majority of cyberspace, Congress removes the bifurcation between IT NSSs and DBSs, or IT used in support of a weapons system. This removes the burdensome and sometimes opaque-to-industry statutes, regulations, and policies that now compel separation. This is keenly required because IT is used in the same cyberspace.

Congress creates an IT type of funding that functions inside the annual federal budget cycle and incorporates NITA language into the FAR. Create a cyber (IT) color of

funding outside the annual federal budget cycle or inside and earlier than the 12-month cycle. A NIT color of money works less on the premise that urgency of delivery has primacy and more on the idea that technological change or enhancements in IT, and as-yet-unknown cyber vulnerabilities drive needed acceleration. Decades of IT acquisition reform by Congress have not resulted in fundamental change in the speed of IT acquisition. A reason is the lack of an express statutory mandate to enable this for IT. Because COTS IT can change so often inside the 12-month budget cycle, multiple IT needs that arise inside this budget cycle can remain unfunded for many months or cause the movement of existing funds from a currently funded need to address the emergent need. Hence, NIT having its own funding enables technology pacing in a way never before seen with multi-year funding.

The DoD's annual budget cycle has its own processes tied to the federal annual budget process. Emergent IT or emergency cyber requirements can change in months, days, or moment by moment. The absence of a statutory budget process to meet those demands results in delays in meeting operational needs such as an emergency or unimagined cyber threat, capability upgrades needed inside a planned IT refresh cycle, and a need to refresh IT in order to remain apace with a dramatic industry change. Reacting to inside-a-year needs causes organizations to jump through the proverbial hoop, jeopardize existing programs, or slip schedules across a portfolio.

Until 2016, and years after the advent of cyberspace, the FAR contained no cyber-related language. As with tanks, rifles, and ships, NIT should be procured by a single acquisition entity charged with IT acquisition under NITA. Because NITA recognizes all IT as a matter of national security, all NIT should be single-streamed to enable enforcement of enterprise standards that support IT governance, resolve training curriculum challenges, and mitigate IT sustainment problems—such as managing concerns that a contract for one type of IT does not conflict with a different contract for different IT.

Congress operationalizes CIOs. Recreate the Federal CIO as the National IT Advisor, place that responsibility with the National Security Council and disconnect it from its current position within the Office of Management and Budget. If a budgeting approach worked, the current status would have eliminated the above-described problems.

Require that federal department and agency CIOs report directly to department/agency heads and be responsible for department/agency IT in every capacity. Doing so reduces the vestigial Clinger-Cohen IT management and administrative authorities that have become a bureaucratic burden. Reposition DoD CIO responsibilities from the Chief

Management Office to United States Cyber Command, and move DoD's Service CIOs to Service Cyber Components, thus operationalizing IT authorities. Fundamentally, network and cyber operators need situational awareness regarding what IT was approved for acquisition along with what IT is about to be plugged into the network. CIOs placed in the cyber component merge all the requisite authorities to use IT with a national security and operational mindset. Aligning CIOs with cyberspace aligns and synchronizes the currently split awareness of IT used in cyberspace; thereby greatly enhancing situational awareness of fielded and operating NIT. NITA enables that awareness to occur prior to connection or operation.

Through NITA's operationalization of CIOs, we eliminate processes and barriers established and cemented over two decades—which created different rules, systems, and processes for DBSs and NSSs. A line would be drawn between new NIT and legacy NIT. New NIT would start fresh under the revised paradigm. Legacy NIT would be modified or gradually phased out of use. The pace of industry-driven changes to IT benefit the rapid mitigation of legacy NIT.

Direct centralized IT acquisition against a known baseline. As with weapon systems, Congress must direct departments, agencies, or components acquire NIT through a single organization within each department, agency, or component. This single organization must also maintain the department's, agency's, or component's NIT baseline. This NIT baseline accounts for all acquired NIT that is fielded, in operation, or in need of sustainment (refresh, upgrade, repair, etc.).

In the current situation, because of confusing federal processes regarding COTS IT, the nature of today and tomorrow's threats via IT, and the common sense that IT is a consumer item, IT acquisition and procurement is conducted by a multitude of entities within each department, agency, or component. Congress having elevated the nation's practical understanding of IT via NITA will drive the need for centralized IT acquisition and procurement. Effective control of IT purchases, employment, and sustainment does not exist at present and, given the above described landscape, the existing and mainly decentralized approach seems seriously out of touch.

In the mid-1990s, IT was purchased at the lowest level determined by IT management authorities. This highly deregulated and dispersed approach soon exposed IT inefficiencies, ineffective control of IT spending, and poor enforcement of IT standards. Because there were no federal IT baselines for measuring any defined level of performance, IT spending proliferated—some would say wildly so. And malicious intent and impacts began to

demonstrate that protection of IT was at worst woefully deficient and at best rudimentary.

In the late 1990s and early 2000s, centralization of IT spending began to occur throughout the federal government, but its implementation began lagging due to a corollary effect that also was developing. There also developed a personal sense that IT use was easily and well understood—and this simply because COTS IT also was used at home and in many other non-work and non-in-extremis situations. As a result, fractures appeared in centralized IT procurement and processes were never fully implemented. And because there were almost no IT baselines, IT controls essentially did not exist.

Hence, whatever kind of IT “need” could be explained was essentially approved for employment by CIOs and this remains the process today. Had the aforementioned controls been put in place circa 2000, we would not have our current IT problems nor would we have continued to experience a large volume of malicious impacts brought about from our colloquial understanding and use of IT. Centralized IT control to an IT baseline directly improves our national security posture.

Conclusion

In our collective minds, the IT problem remains far less important than one of national security urgency. We are lucky to have not yet experienced a monumentally expensive cyberattack. Our current bifurcated, complex, and vestigial processes hinder optimization of IT practices and diminish our national security. Our CIO-centric business management approach keeps us lulled into using an atrophied process that is inherently administrative and almost entirely void of an operational mindset and thus lacks a national security level of seriousness.

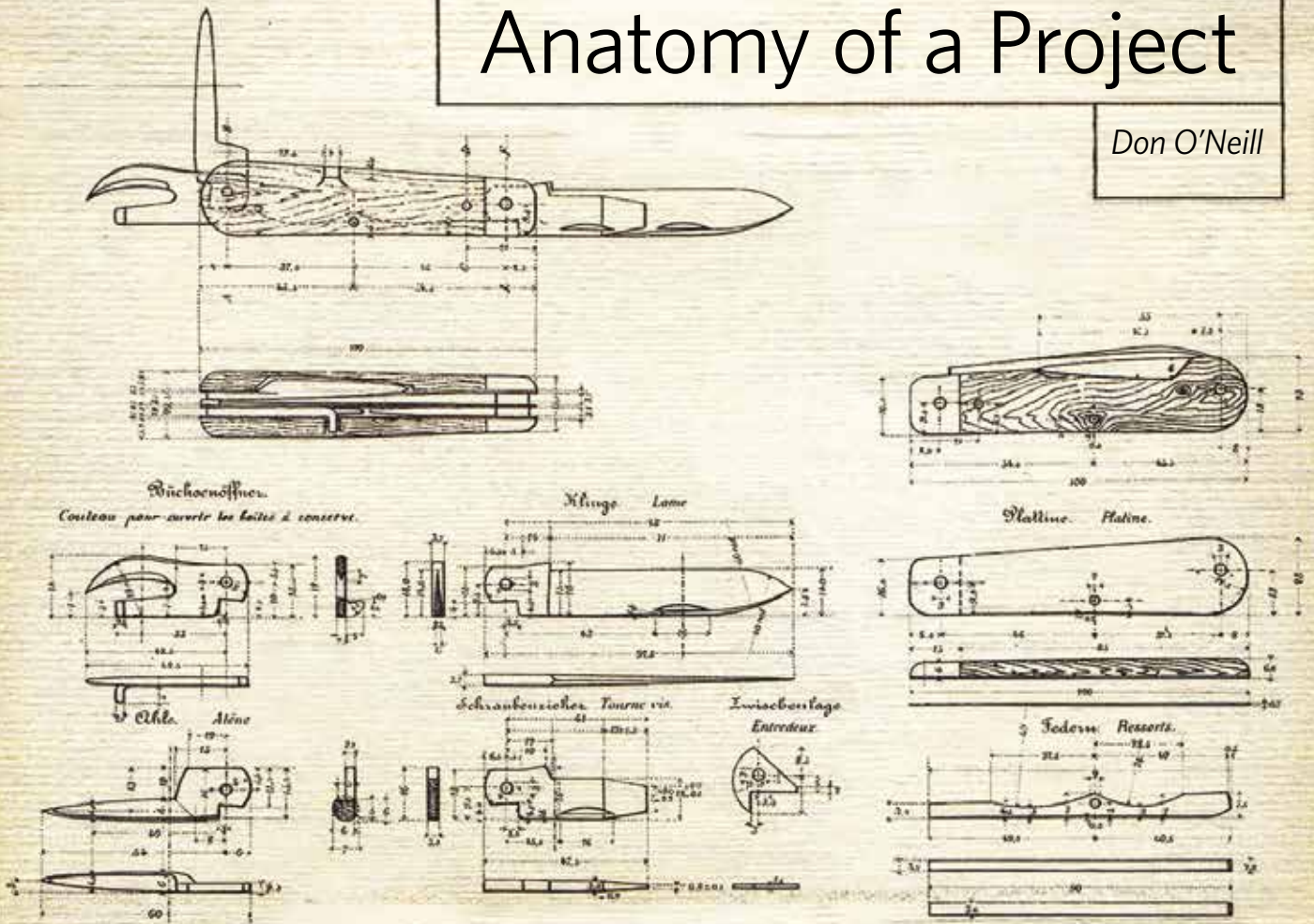
We continue to ignore many, many years of warning signs caused by globally connected actors causing billions of dollars in business losses, terabytes of stolen intellectual and technical property, and compromises to the sanctity of our personal information. Our current lackluster and consumeristic IT processes have placed the United States at a grave disadvantage in a cyber battlespace, which requires disconcertingly great competition to survive. Congress should enact NITA. Short of some terrible event, only Congress can change the nation's paradigm for how we think about IT—how we fund, buy, employ, protect, and innovate IT.

Timeliness creates relevance and, while we cannot go back in time to prevent today's problems, now is most certainly the time to fix them.

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Diagramming the Anatomy of a Project

Don O'Neill



DIAGRAMMING THE ANATOMY OF A PROJECT DEMANDS THE RIGHT MIX OF GENERALIST AND specialist skills, skills that combine both interconnecting parts and depth of knowledge.

Diagramming in terms of Essence alphas helps in determining the value of applicants to the organization. Essence (made up of the universals) spans the customer, solution, and endeavor. It begins by focusing on the customer in terms of alphas (essentials) for stakeholders and the opportunity value proposition. It goes on to frame the solution in terms of alphas for requirements and architecture including parts and their relationships. It finishes up by framing the endeavor in terms of alphas spanning the team, the way of working, and the status of the work itself.

With the anatomy of the project diagrammed in terms of alphas, staffing can proceed along the lines of program management experience, up-to-date technical knowledge, and project management experience. More program

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management experience is needed to understand stakeholders and the opportunity value proposition. More up-to-date technical knowledge is needed to understand requirements and the architecture of parts and relationships. The right blend of experience and technical knowledge is needed to understand the team, way of working, and work progress. If each applicant is assessed in terms of these alphas and the needs of the organization, a rational hiring policy can be established and practiced.

Think Swiss Army Knife

Essence is the Swiss Army Knife, and the alphas are the blades that make it an all-purpose tool (Figure 1). Like the Swiss Army knife, the value of Essence lies in its usefulness.

Why? Whether you establish criteria at the beginning of a project or not at all, there exist industrial strength objective criteria for learning the status of a project and pointing the way forward. These criteria can be found in the Software Engineering Method and Theory (SEMAT) formulation and its Essence Kernel, the essence and common ground of software engineering.

What? This common ground of seven dimensions termed alphas is intended to be independent of particular methods, practices, and tools. The alphas possess the capability to reason about progress and assess status of any software project regardless of method and practice selections spanning the customer space, the solution, and the endeavor.

How? Simple yet powerful, these sensible alphas and their natural states of progression are actually very useful in setting expectations and guiding a project on its way and in guiding a software industry that has lost its way. More specifically, the alphas and the sequence of their state transitions include:

- Stakeholders are recognized, represented, involved, in agreement, satisfied with deployment, and satisfied in use.
- Opportunity is characterized as identified, software

needed, value established, viable, addressed, and benefit accrued.

- Requirements are conceived, bounded, coherent, acceptable, addressed, and fulfilled.
- The software system architecture is characterized as selected, demonstrable, usable, ready, operational, and retired.
- The team is selected, formed, collaborating, performing, and adjourned.
- The way of working is characterized as principles established, foundations established, in use, in place, working well, and retired.
- Work is characterized as initiated, prepared, started, under control, concluded, and closed.

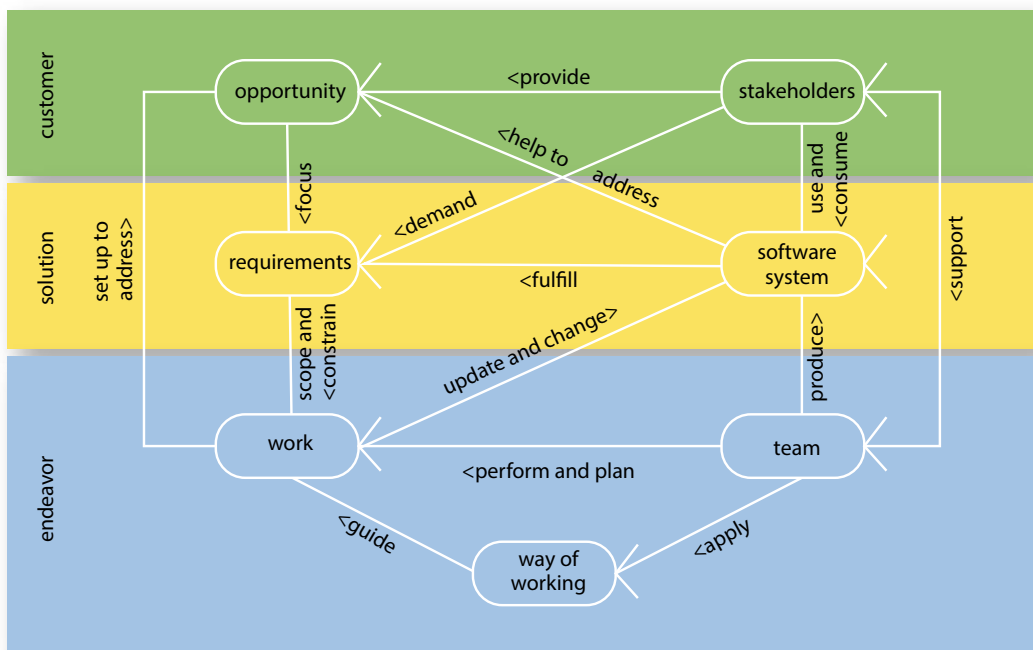
Four Examples

Four real world examples using the Essence paradigm to good effect with senior managers facing consequential challenges are shown as illustrations of diagramming the anatomy of a project. One involves Facebook, another involves the Boeing 737 Max8, the third involves the Navstar Global Positioning System, and the fourth focuses on Coronavirus. These data analytics projects as framed are innovative, consequential, useful, and forward looking.

Facebook

Consider the following e-mail exchange with Ed Amoroso, Facebook Board Member.

Figure 1. The SEMAT Essence Kernel Alphas



Source: The author.

Whether you establish criteria at the beginning of a project or not at all, there exist industrial strength objective criteria for learning the status of a project and pointing the way forward.

Ed,
It would be helpful to others, if not Mark Zuckerberg, and the Facebook Board, to frame the Facebook board recommendations more precisely in terms of stakeholders, opportunity, requirements, software system, way of working, team, and work.
Don

Ed responded: ... *this is a great list.*

Ed,
Here are some useful ways to adopt the items on the list in sync with your board recommendations.

Stakeholders include the using public, Facebook, and government oversight as involved, in agreement, and satisfied with deployment. Opportunity includes freedom and privacy in a way that restores corporate reputation through value established with viable benefits accrued. Requirements should tighten content through real-time monitoring and adherence to agreed-to standards that are bounded, coherent, acceptable, and fulfilled. The software system involves fielding a live, full-alert nerve center for policing content using demonstrable, usable, and operational Artificial Intelligence. The way of working should stop all unacceptable posts and deliver necessary consequences for failure putting in use established principles and foundations that are made to work well. The team will utilize Facebook and government in a collaborating and high performance manner. Work will be initiated, prepared, started, placed under control, and sustained.

Boeing 737 Max8

The Boeing 737 was redesigned with a new engine and mounting to match the recent Airbus A320 competitive entry. The new engine mounting altered the center of gravity causing the plane's nose to pull upward and stall the engine. The Maneuvering Characteristics Augmentation System (MCAS) was intended to compensate for the lack of re-engineering.

Stakeholders include the divergent interests of the flying public and buying airlines. The public demands safety, and

the airlines demand competitive operating cost advantage. Both Boeing and the Federal Aviation Administration (FAA) tilted in favor of the airlines' interests. Opportunity includes the flying public, which would like to take off and land without crashing under all circumstances. This was subordinate to the Boeing need to be competitive against Airbus. The Boeing 737 has a 50-year history; Airbus has a 20-year history. Consequently, Airbus A 320 was inherently better positioned to adopt changes and modernize. Requirements include managing the Angle of Attack (AOA) behavior and providing a stall escape maneuver. The software system includes MCAS designed to manage AOA behavior. The way of working demands maintaining proper separation of oversight between Boeing and FAA. Oversight was diluted by extreme collaboration. In effect, Boeing and the FAA colluded to corrupt the oversight responsibility, rendering it illegitimate. Team shortfall includes extreme Boeing and FAA collaboration, impacting FAA's oversight responsibility. The FAA lacks the engineering capability to perform adequate oversight. Boeing engineers are retiring in greater numbers and next-generation engineers are not up to the task. Work involved a software "patch" process rather than the redesign needed.

Some questions demand answers. Just when did Boeing offer the safety options that neither of the two crashed airlines chose to purchase? Clearly Boeing suspected it had a problem when it offered the safety options. Did Boeing offer the additional safety options expecting that some airlines would decline, thereby, shifting the responsibility for any incidents to the airlines themselves?

Navstar Global Positioning System (GPS)

The Navstar GPS is a satellite-based radio navigation system that provides navigation data to GPS-equipped users with which they can determine their three-dimensional position, velocity, and time.

Stakeholders include military operators, weapon systems users, commercial transportation users, and public transportation users. The opportunity is intended to deliver accurate and precise navigation data that enable users in land, air, and sea to determine three-dimensional position, velocity, and time. The requirements are to coordinate the Operational Control Station composed of Master Control

Station, space segment of operational and spare satellites, Ground Antennas, and Monitor Stations. The software system spans the use of State Machines, Modules, and Programs to express Computer Program Configuration Items for Executive, Control and Display, Ephemeris, Clock, Space Vehicle Command Status, Network Control, Performance Analysis, Math Library, Space Vehicle Positioning, Mission Scheduler, Scenario Generator, and System Log. The way of working spans a concept of operations, requirements specifications, incremental design, development, and testing. The team supports land-based operations, program management, systems engineering, software engineering, and test operations. Work is tracked using monthly earned value metrics.

Coronavirus

As an example, the Coronavirus epidemic is a common problem to address jointly, one that is outside the domain and range of software and systems-engineering experience. An attempt to apply Essence and its seven alphas to the Coronavirus challenge resulted in the following:

Stakeholders include the world's people, governments, and medical communities. The opportunity value proposition is to anticipate, avoid, mitigate, and recover from the effects

of the Coronavirus under all circumstances of use, including the necessary sharing and sacrifice among various populations. Requirements include understanding the sources of the virus, modes of transmission, speed of transmission, incubation period, death rate among various populations and specific demographic groups, and effectiveness of inoculation and quarantine protocols. Domain Specific Architecture spans research vaccination, detection, and quarantine protocols. Way of working includes vaccination and quarantine protocols. Team involves general population sacrifice in accepting vaccination and quarantine, government sharing of resources, and medical community sharing of knowledge. Work includes measuring the extent of effective vaccination, vaccination rate among various populations and demographics, and the state of quarantine protocols among various populations.

Note : *The maturity of a Domain Specific Architecture is determined by the breadth and depth of recorded experience on the models, methods, and paradigms used in the application domain. Breadth includes the pieces and their relationships. Depth measures the maturity of each element of functionality on a continuum including industrial standardization, integrating context, stand-alone capability, and piecemeal services.*

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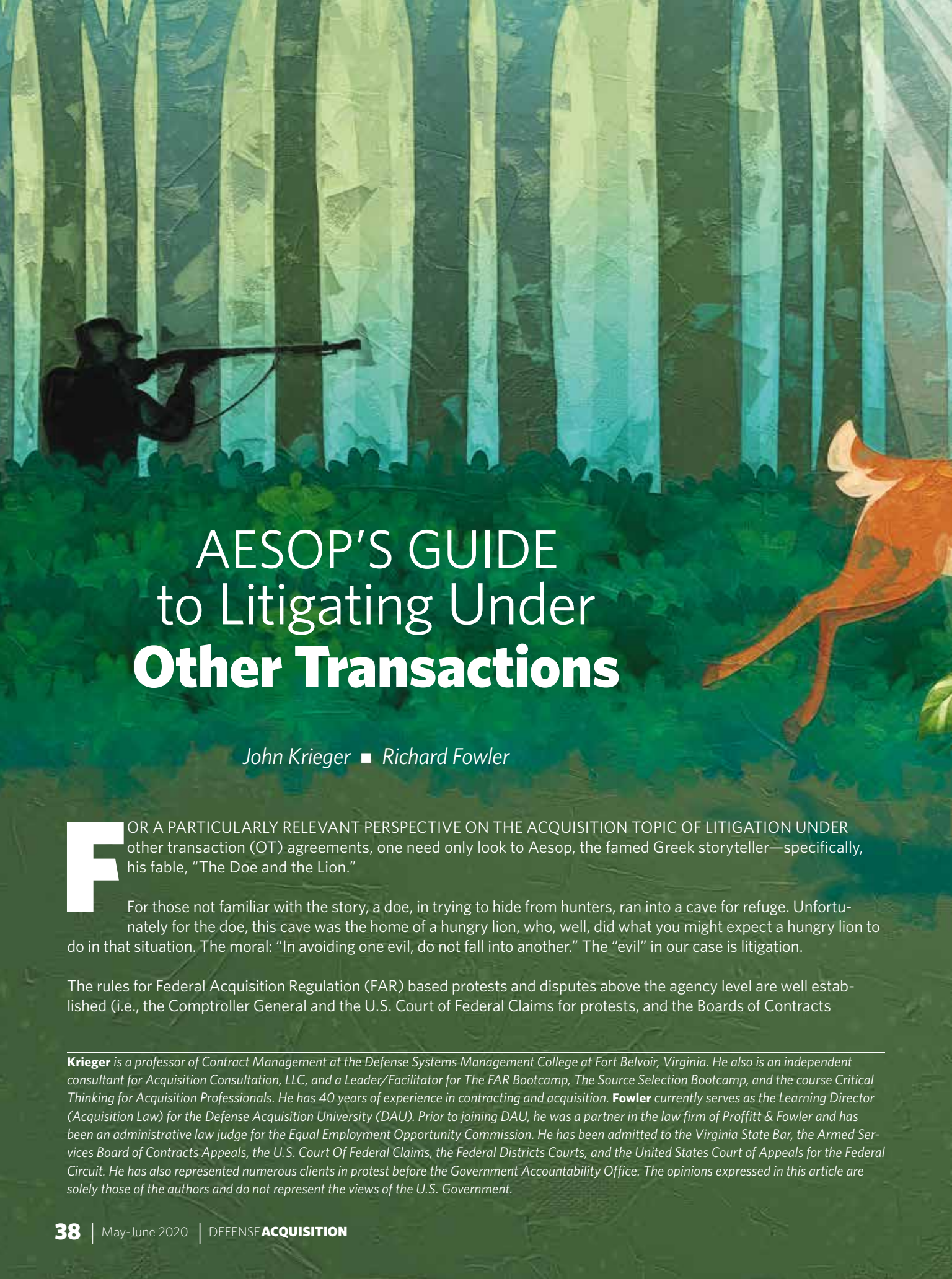
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DEFENSE
ACQUISITION



AESOP'S GUIDE to Litigating Under Other Transactions

John Krieger ■ Richard Fowler

FOR A PARTICULARLY RELEVANT PERSPECTIVE ON THE ACQUISITION TOPIC OF LITIGATION UNDER other transaction (OT) agreements, one need only look to Aesop, the famed Greek storyteller—specifically, his fable, “The Doe and the Lion.”

For those not familiar with the story, a doe, in trying to hide from hunters, ran into a cave for refuge. Unfortunately for the doe, this cave was the home of a hungry lion, who, well, did what you might expect a hungry lion to do in that situation. The moral: “In avoiding one evil, do not fall into another.” The “evil” in our case is litigation.

The rules for Federal Acquisition Regulation (FAR) based protests and disputes above the agency level are well established (i.e., the Comptroller General and the U.S. Court of Federal Claims for protests, and the Boards of Contracts

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Appeals and U.S. Court of Federal Claims for disputes). The litigation fora for OTs are not so well established, and are still evolving. This article explores that particular cave.

Congress has passed specific legislation granting other transaction authority (OTA) to 11 executive agencies. The Department of Defense (DoD) gets its authority through Title 10 of the United States Code (U.S.C.):

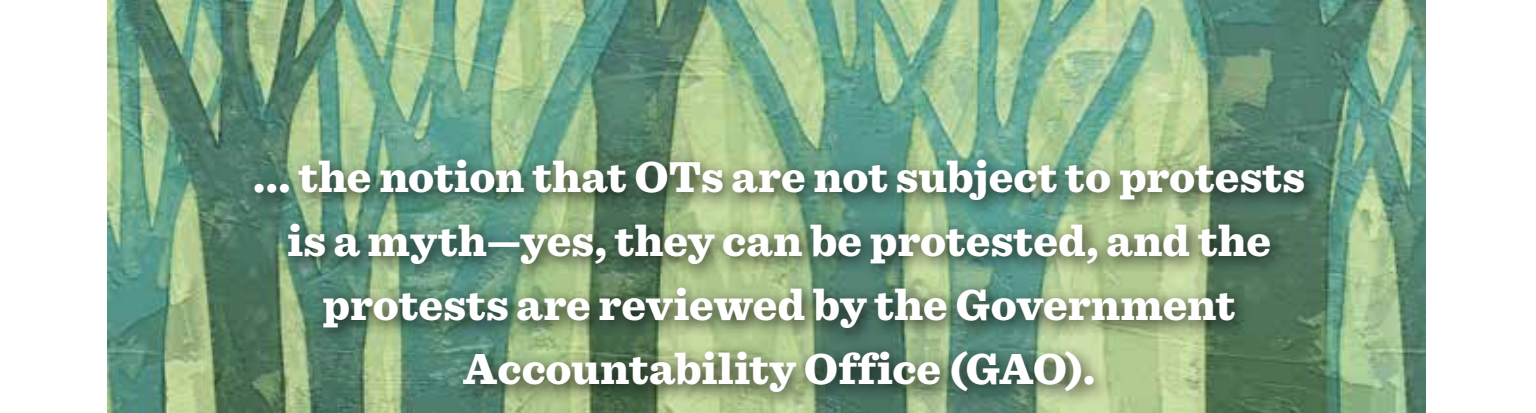
Additional Forms of Transactions Authorized. The Secretary of Defense and the Secretary of each military department may enter into transactions (other than contracts, cooperative agreements, and grants) under the authority of this subsection in carrying out basic, applied, and advanced research projects. The authority under this subsection is in addition to the authority provided in section 2358 of this title to use contracts, cooperative agreements, and grants in carrying out such projects.

A federal court, the comptroller general, or a board of contracts appeals will tell you that an OT is a contract, using the term contract in a broad sense. When dealing with U.S. Government acquisitions, the term contract takes on narrow meanings based on the instrument used (e.g., procurement contract, OT, cooperative agreement, grant, or Cooperative Research and Development Agreement).

The preferred approach to resolving issues in the acquisition process is always to do so at the lowest level possible (i.e., the contracting officer). If the parties fail to resolve the issue at the agency level, the next best alternative is to resolve it through Alternate Dispute Resolution (ADR) procedures. Failing that, litigation.

Guidance on Litigating OTs

There is little to go on. The term “Other Transaction” (as in “Other Transaction Authority” and “Other Transaction



... the notion that OTs are not subject to protests is a myth—yes, they can be protested, and the protests are reviewed by the Government Accountability Office (GAO).

Agreement”) appears in only 14 federal court cases, 12 comptroller general cases, and 2 boards of contract appeals cases. Let’s explore them.

Part 1: Protests

Ten of the 11 agencies currently granted OTA by Congress have issued guidance to implement their authority. The DoD’s current OTA guidance was issued in the form of its *Other Transactions Guide*. So, what does the *OT Guide* have to say concerning protests? For one, it states that the notion that OTs are not subject to protests is a myth—yes, they can be protested, and the protests are reviewed by the Government Accountability Office (GAO). Under the Section III heading “Legal Considerations,” the *OT Guide* states:

While bid protests are rare for OTs, agencies should be mindful of the possibility. Agency-level protests are possible if the agency chooses [sic] to include language in its solicitation describing the procedures. While not required, agencies may want to include such language to encourage any issues to be handled internally and quickly. GAO has limited jurisdiction to review OT decisions and protests to GAO regarding OT awards are rare. Protests to the U.S. Court of Federal Claims are also possible but are rare occurrence [sic].

Based on this guidance, you may not be too worried about the potential for protests related to OTs, which is probably true. But it is also true of protests under the FAR. Nonetheless, it appears that the discussion in the *OT Guide* does not nearly grasp the complexity of the potential for litigation.

To fully understand the potential for litigation on OTs, you must look into litigation on other kinds of non-FAR-based “contracts” (grants, cooperative agreements, cooperative farming agreements, etc.).

When it comes to protests related to OTs, where can an interested party (e.g., unsuccessful offeror) go?

Comptroller General

GAO has parsed its jurisdiction over protests, claiming jurisdiction in some cases and denying it in others. GAO first expressed the dichotomy in the mid-1990s in a case involving the Advanced Research Projects Agency’s (ARPA), now the Defense Research Projects Agency (DARPA), use of an OT:

We generally do not review protests of the award, or solicitations for the award, of cooperative agreements or other nonprocurement instruments because they do not involve the award of a “contract.” We will review, however, a timely protest that an agency improperly is using a cooperative agreement or other nonprocurement instrument, where under the [Federal Grant and Cooperative Agreement Act] a “procurement contract” is required, to ensure that an agency is not attempting to avoid the requirements of procurement statutes and regulations.

The GAO has used that analysis in a number of cases over the years. Sometimes asserting jurisdiction and sometimes denying it.

U.S. Court of Federal Claims (COFC)

We found one OT protest before the COFC: *Space Exploration Technologies Corp. v. The United States and Blue Origin, LLC, et al.* The United States argued for dismissal for lack of subject-matter jurisdiction. SpaceX argued that its “complaint falls squarely within this court’s jurisdiction under the Tucker Act, because SpaceX asserts violations of law ‘in connection with a procurement or proposed procurement.’ ” SpaceX hedged its bets, arguing that if the Court decided it did not have subject-matter jurisdiction, then it would request that the Court transfer venue to the District Court. In August the Court: (1) granted the government’s motion to dismiss; (2) granted SpaceX’s motion to transfer venue; and (3) dismissed the complaint.

We found other nonprocurement contracts cases that shed light on how the authority of the COFC to hear OT protests might be treated. *HYMAS v. The United States* was first heard in the COFC, which determined that it had subject-matter jurisdiction under the Tucker Act. The government appealed the decision to the U.S. Court of Appeals, Federal Circuit, which vacated and remanded the decision of the COFC.

In the case, the Court distinguished between a “cooperative agreement” and a “procurement contract” to resolve the issue at hand:

Whether a contract between a federal agency and another entity is a procurement contract or a cooperative agreement is a question of law.

It continues:

[T]he Claims Court's bid protest jurisdiction under 28 U.S.C. 1491(b)(1) speaks "exclusively" to "procurement solicitations and contracts." Because the Tucker Act does not define the term "procurement" . . . , the court has relied upon the definition of "procurement" in 41 U.S.C. 111 "to determine whether a 'procurement' has occurred . . ." The definition of "procurement" in 41 U.S.C. 111 is not the only provision relevant to our inquiry, nor does a "procurement contract" encompass the entire universe of instruments at executive agencies' disposal. In 1978, Congress passed the [Federal Grant and Cooperative Agreement Act] in light of its findings that there was "a need to distinguish [f]ederal assistance relationships from [f]ederal procurement relationships," as well as "uncertainty as to the meaning of... 'cooperative agreement.'"

What we have here is a possible division in the Court's OT bid protest jurisdiction. If the protest is for a "traditional" OT—i.e., one for only research and development, where the government does not receive anything outright—the COFC will not have the jurisdiction; however, if the OT is for a limited production or would lead to limited production, the COFC would have jurisdiction.

District Courts

In the District Courts, we have *ORBITAL ATK, INC.*, *Space Logistics LLC*. In only this case did a District Court hold that it did not have jurisdiction, but it was because the Court concluded that the Orbital ATK lawsuit was addressing a "program," not an individual "action."

In early 2019, MD Helicopters filed an OT protest at the District Court (Arizona) of the Army's decision not to advance its proposal for Phase 1 of an attack reconnaissance aircraft competition. The Court had one initial question (i.e., "Does the District Court have jurisdiction to hear the case?"). The Court ordered the government to submit a supplemental brief to address the issue.

In response, the government submitted a 13-page document addressing the issue. The following is part of the introduction to the more detailed discussion:

The sunset provision under [the Administrative Dispute Resolution Act (ADRA)] only terminated district court jurisdiction over bid protests relating to procurements; it did not terminate district court jurisdiction over bid protests relating to non-procurements. . . . Significantly, and directly on point to the Court's inquiry, the solicitation for the OTA at issue is not a "procurement" for purposes of ADRA, and, accordingly, ADRA does not bar district court jurisdiction over this action.

On Jan. 24 the Court ruled that it lacked jurisdiction and dismissed the case without prejudice. The Court noted: "Despite the broad language used in these sources, this Court need not determine whether all OTs are contracts. Instead, this Court must look to the OT agreement at issue in this case." Now the question is whether MD Helicopters or the United States will appeal.

Part 2 : Disputes

What does the *OT Guide* have to say concerning disputes?

Although OTs are not subject to the Contract Disputes [statute], an OT dispute can potentially be the subject of a claim in the Court of Federal Claims. The government team should ensure each OT addresses the basis and procedures for resolving disputes. The government team should seek to reduce the risk of costly litigation by negotiating disputes clauses which maximize the use of Alternate Dispute Resolution (ADR) procedures when possible and appropriate. The government team should consult with legal counsel for assistance in crafting ADR clauses. Incorporating language that allows disputes to be handled at the lowest level possible is generally a best practice.

Based on what the *OT Guide* says, you may not be too worried about the potential for disputes related to OTs. The truth of the matter is that even under a FAR-governed contract, where people live in fear of claims and disputes, there isn't much potential for litigation.

Boards of Contract Appeals

The Armed Services Board of Contract Appeals has published two decisions involving OTs (i.e., United Launch Services, LLC [2013 and 2016]), neither of which is enlightening. The contract mixed work under OTA and under an FAR-governed contract. The disputed portion was under the FAR-based portion, where jurisdiction is unquestioned. We found no dispute cases before the Civilian Board of Contract Appeals.

Both of these results are expected because the authority of the agency boards established under 41 USC 7105(a) and (b) are limited to "procurements" of various kinds and the disposal of personal property.

U.S. Court of Federal Claims

Based on the "outs" and "ins," it would appear that the appropriate forum for disputes of OTs is the COFC. The court specifically addressed the subject of jurisdiction in *Spectre Corporation v. United States*:

This Court's jurisdictional grant is found primarily in the Tucker Act, which provides the U.S. Court of Federal Claims the power "to render judgment upon any claim against the United States founded either upon the Constitution, or any



... when considering the parties involved, there is often more than one court that could legitimately have both subject-matter jurisdiction and jurisdiction over the parties involved.

Act of Congress or any regulation of an executive department, or upon any express or implied contract with the United States ... in cases not sounding in tort.

Other significant non-[Contract Disputes statute] Tucker Act contract-related actions include cases where the government has a contract with a party for other than the procurement of goods or services, such as uranium enrichment cases, spent nuclear fuel cases, the Patient Protection and Affordable Care Act (ACA) cases, contract disputes arising out of grants or cooperative agreements, and “other transaction authority” agreements. ... The boards do not have jurisdiction over these non-[Contract Disputes statute] cases, so they must be brought in the [COFC].

In *Thermalon Industries, Ltd. v. U.S.*, the Court provided an extensive discussion of its Tucker Act jurisdiction as it applies to contracts other than procurement contracts. Although not specifically addressing OTs, it can reasonably be assumed it would apply to them.

This action is before the court on defendant’s motion to dismiss the complaint. ... Defendant contends that the grant in issue is properly characterized as an agreement intended to effectuate the sovereign obligations of the United States and that all such agreements necessarily fall outside the scope of this court’s jurisdiction under the Tucker Act.... [T]he court concludes that the instant grant agreement satisfies the criteria for an express or implied contract with the United States and, thus, falls within the scope of this court’s Tucker Act jurisdiction.

District Courts

The MD Helicopters Inc. protest case was not the first time a district court had taken on an OT claim case. Neither of the two cases we found are of concern here, neither hitting directly as to jurisdiction. In *G & T Conveyor Company, Inc.*, the OT was awarded by the Transportation Security Administration (TSA), but the defendant actually was the Allegheny County Airport Authority. In *United States of America, ex rel. Leo Danielides, and Leo Danielides, individually, v. Northrop Grumman Systems Corporation* it was a False Claims Act case, not a dispute over an OT claim.

The limited decisions at the District Courts and the Courts of Appeals indicate little or no concern over jurisdiction. Neither of the two previously discussed “claims” cases at the District Court get to that particular issue. However, keep in mind the analysis discussed in Part 1 of this article regarding protests (HYMAS). That said, we did not find a case where the district court had taken on the issue of jurisdiction.

Forum Shopping

Forum shopping is a time-honored tradition among attorneys. One of the coauthors has done his fair share. The truly sad thing is that forum shopping shouldn’t be necessary. It occurs because of the tendency of some judges to “legislate from the bench” rather than limit themselves to interpreting laws and regulations.

For OTs, with 94 district courts spread across nine regions, forum shopping becomes more of an issue than in FAR-based procurements. While arbitrary “forum shopping” is frowned on by many state bar associations, it is a perfectly ethical litigation tool. Any Court selected must not only have subject-matter jurisdiction and the right to hear the type of case, but it must also carry jurisdiction as to the parties involved. However, when considering the parties involved, there is often more than one Court that could legitimately have both subject matter jurisdiction and jurisdiction over the parties involved.

More in Store?

While it may not be an axiom in federal procurement, the phrase “follow the money” is certainly something every acquisition professional understands. As agencies with OTA seek greater use of OTs, they need to accept that the number of protests and claims will increase proportionally. It must be recognized that as the DoD spends more of its budget under OTA, especially with authority for limited production, the numbers will climb.

Stand by—this is an evolving issue. We may yet see Congress enter the discussion. As such, it is important to keep the moral of “The Doe and the Lion” in mind—“in avoiding one evil, do not fall in another.”

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Contract Award Protest Rulings

Highlights From the GAO Report for 2019

Janel C. Wallace, J.D.

Every year, the Government Accountability Office (GAO) reports to Congress on its most prevalent basis for sustaining protests. It also advises Congress if any agency failed to follow GAO's recommendations. No agency failed to follow GAO recommendations during the last fiscal year.

The GAO "sustains" a protest when it recommends that the protestor receive some form of relief. The GAO's report for Fiscal Year (FY) 2018 revealed that the rate by which the U.S. Government sustained protests decreased from 17 percent in FY 2017 (99 cases) to 15 percent (92 cases).

Note: The author's examination of the GAO rulings for FY 2016 was published in the January-February 2018 issue of the *Defense Acquisition's* predecessor, *Defense AT&L*, pages 38-43; the rulings for FY 2017 appeared in the May-June 2018 *Defense AT&L*, pages 43-49; the rulings for 2018 appeared in *Defense Acquisition* magazine's July-August 2019 issue, pages 40-46.

In FY 2019, GAO SUSTAINED (FOUND FOR THE protestor) 13 percent of the protests filed, down 2 percent from FY 2018. GAO provides its most prevalent grounds for why it sustained protests last fiscal year, they are:

- Unreasonable technical evaluation
- Inadequate documentation of the record
- Flawed selection decision
- Unequal treatment
- Unreasonable cost or price evaluation

GAO submitted its annual report to Congress for Fiscal Year 2019 in November 2019. GAO remained operational during the 35-day government shutdown between December 2018 and January 2019. The partial shutdown did not affect filing deadlines for protestors and private parties.

Wallace is a professor of Contract Management at the Defense Acquisition University at Fort Belvoir, Virginia. She is a U.S. Air Force veteran, a former litigation attorney and a former contract specialist. She holds a law degree from the University of North Dakota.

Deadlines affecting agency filings were tolled during the shutdown and GAO established revised filing deadlines for those agencies affected when the appropriation lapse was resolved. Eight protests had their decisions extended due to the shutdown.

GAO provided example cases for its most prevalent grounds, as follows.

Unreasonable Technical Evaluation

GAO cites Native Energy and Technology, Inc. B-416783, as its example case for where an agency performed an unreasonable technical evaluation. In this case, the agency, United States Customs and Border Protection, sought proposals for preventative maintenance and repairs of equipment at some of its facilities. The solicitation contemplated that an Indefinite-delivery, Indefinite-quantity contract with a one 1-year base and four 1-year options would be awarded. The solicitation also informed offerors that they would be evaluated on price and three non-price factors listed in descending order of importance:

- Technical approach, which included overall technical approach and experience with overall technical approach being more important than experience
- Overall management approach
- Methodology and past performance

The solicitation informed offerors that the non-price factors when combined were significantly more important than price. The agency received nine proposals, including one from the protestor and one from the incumbent. The protestor's price was lower than the incumbent's. The agency rated the incumbent higher than the protestor in the non-price factors and awarded the contract to the incumbent (hereafter awardee). The government gave protestor a debriefing and protestor filed its protest. The GAO sustained the protest based on two of the protestor's arguments: (1) the agency unreasonably evaluated the awardee's technical proposal and (2) the award decision was unreasonable.

GAO found that the agency unreasonably evaluated the awardee's technical proposal by finding strengths that did not exist in its proposal. The agency argued that it could use its own knowledge of awardee's performance based on the prior contract it had with the agency. According to GAO, evaluation generally is limited to the proposal; however, an agency can in some circumstances use extrinsic information it is aware of such as past performance, experience, or technical acceptability in supplementing its evaluation. An agency may not assume or infer that an offeror will use a technical approach it does not provide in its proposal. An agency may also not use the inferred technical approach as a discriminator when it makes award. An agency may not give a favorable evaluation based on an

assumption that an incumbent would perform the contract in a superior manner to any other offeror.

There were three discriminators in this case where the GAO found the agency improperly inferred or assumed the awardee included information in its technical approach. In the first discriminator, the Request for Proposal directed offerors to include a comprehensive preliminary Preventative Maintenance Schedule. Awardee failed to provide this schedule but the Contracting Officer assumed it would provide one each week, based on its performance in the incumbent contract.

In the second discriminator, the agency also assumed awardee would act similarly in its performance of the previous contract by uploading information in a Web-based tracking system. GAO disagreed with the agency's argument that it acted reasonably in assuming or inferring that awardee would perform the same as it did on the incumbent contract.

In the third discriminator, the agency assumed the proposal submitted by awardee included training required by the performance work statement (PWS). The Contracting Officer asserted that awardee's failure to expressly address training did not affect the award decision. GAO found no basis for this assertion since the PWS requirement was mandatory and therefore was likely to impact the award decision. GAO determined that the agency also improperly used the more favorable phrase of "real time" as it applied to the second and third discriminators when describing awardee's providing access to information as opposed to the "near real time" the awardee actually proposed. The agency was aware of the two different terms used but was unable to explain its belief that "real time" and "near real time" meant the same thing.

The agency award decision was found to have been unreasonable and that there was competitive prejudice against the protestor because of the improper evaluation of the three discriminators previously mentioned and not because of protestor's argument. The protestor's argument held that the Contracting Officer improperly relied on the technical evaluation team's report and the Source Selection Advisory Counsel's award recommendation. GAO concluded that the Contracting Officer exercised independent judgment despite not performing an independent review of the proposals and that independent analysis was sufficient.

The protestor lost on the other two arguments it raised. One argument was that the agency incorrectly evaluated its proposal. The GAO found that protestor failed to cite anything specific and that its arguments on how it was evaluated were untimely and not detailed. The other unsuccessful argument was that the agency failed to

An agency may not assume or infer that an offeror will use a technical approach it does not provide in its proposal.

consider the negative past performance information of the awardee. GAO disagreed and determined that the agency did consider awardee's negative past performance and that awardee improved its performance. The agency considered the improvement in forecasting awardee's likely success in performing the contract. GAO cited the agency's discretion in this matter as well as what FAR 15.305(a)(2) says should be considered; that is the currency and relevance of the past performance information, the source of the information, context of the data, and the general trends in the contractor's performance.

Inadequate Documentation

GAO cites NavQSys, LLC, B-417028.3 as its example case where an agency inadequately documented the record. In this case, the Department of the Army, Army Materiel Command (AMC), took voluntary corrective action after the previous protestor challenged the award. Corrective action occurs when the agency informs GAO that it will attempt to resolve the issues brought by a protest filer to avoid GAO having to resolve them. In a significant number of protests, the agency employs voluntary corrective action. The agency is not required to disclose why it chooses to engage in corrective action. The agency's corrective action in this case was to terminate awardee's contract for convenience and to award it to the former protestor. As a result, the former awardee who had its contract terminated filed a protest (hereafter referred to as protestor) claiming that the corrective action was unreasonable and inadequately documented.

The protestor asked clarification questions about the facility clearance requirement prior to the initial award. The agency never responded to those inquiries. Protestor indicated it had conversations with the agency and as a result believed it was determined ineligible for award because its joint venture did not have its own facility clearance. The agency did not address the conversations with protestor but broadly claimed it was not eligible to compete. It was unclear from the record whether the agency determined the protestor was ineligible to compete for the contract or the protestor's proposal was technically unacceptable. GAO reviewed agency internal e-mails that indicated the corrective action was prompted by protestor's inability

to meet the facility clearance solicitation requirement. The record had no documentation about the agency's determination of protestor's competitive eligibility so the GAO requested additional documentation relating to the agency's conclusion that protestor did not meet the facility clearance solicitation requirement. The agency stated that there were no additional documents.

GAO found that the agency did not clearly interpret the facilities clearance provision or explain how it applied to the protestor's proposal. The agency reevaluated proposals when it said it would not, then failed to document its findings. As a result, the GAO was unable to conclude that the agency had a reasonable basis for its corrective action (the termination of protestor's award).

Flawed Selection Decision

GAO cites Harmonia, Holdings Group, LLC, B-417475 as its example case of a flawed selection decision. In this case, the agency, the Department of Agriculture's Animal and Plant Health Inspection Service, issued a Request for Quotation as a small business set-aside to vendors holding contracts under the General Services Administration Federal Supply Schedule (FSS) for Information Technology. The award was for a task order to three software systems with an estimated value of \$15 million and a ceiling of \$19 million over a base and four option years. The protestor lost the competition and brought a protest asserting several arguments to include issues with the agency's cost/price evaluation; the agency's past performance evaluation; the agency's assessment of weaknesses to protestor's quotation and the agency's best value trade-off decision.

GAO sustained part of protestor's challenge of the agency's cost/price evaluation. It dismissed protestor's claim that the agency conducted an improper price realism analysis but it did agree that the agency's evaluation of its optional contract line item numbers (CLINs) was unreasonable. The agency reviewed hourly labor rates of five key personnel positions located on CLINs in reaching its conclusion that awardee's cost was lower. Using the five rates to draw the conclusions about the total cost of performance of a 5-year task order was what GAO

GAO determined that there were weaknesses assessed against protestor that were unreasonable, inconsistent with the terms of the solicitation and which the agency failed to adequately document.

considered unreasonable. GAO pointed to the lack of clarity in the contemporaneous record as to why the agency only selected five of the six key personnel to evaluate and how those five represented the overall proposals. The methodology the agency used failed to consider the structure of each offeror's proposed hourly rates and proposed positions. The agency did not consider the estimated level of effort such as the number of hours for each labor category or specific tasks that would be performed under the optional CLINs.

The GAO disagreed with the agency's argument that it was clear in how it would evaluate the cost/price since the solicitation's plain language provided for a general evaluation of the cost/price factor and did not have a specific methodology for evaluating the optional CLINs. The plain language of the solicitation directed offerors to provide hourly rates but to not provide total amounts for the optional CLINs because they were to be priced separately at the time the option was exercised. The solicitation as it was written did not enable the agency to use the optional CLINs to conduct a reasonable evaluation of total price.

GAO disagreed with protestor's argument that the awardee's quotation should be disqualified as noncompliant for failing to identify past performance references similar in size scope and complexity to the contract requirements because the solicitation used non-mandatory language in that the references provided "should" be similar in size, scope, and complexity. GAO did agree with the protestor's argument that the evaluation was inconsistent with the solicitation. The agency was to evaluate the past performance in part upon the degree that the past performance examples reflected performance of projects similar in size, scope and complexity to the prospective contract. Awardee was scored higher than protestor in its past performance but there was no documentation justifying the evaluation to support the higher rating. There was nothing in the record to support whether or how the agency evaluated the past performance as required by the solicitation (the degree to which the references provided by offerors were similar in size, scope and complexity to the solicitation requirements). The only discussion on the agency's evaluation was in the award determination where it stated that the

technical evaluation board completed the initial past performance ratings based on past performance information included in the offeror's proposals. The awardee was assessed a strength for working on "larger, better systems before" without documentation showing the basis or reference used to conclude the existence of this strength.

The agency tried to justify its evaluation through its use of additional information from other sources such as the Past Performance Information Retrieval System and firsthand knowledge of two key personnel of awardee and of a prior contract held by the protestor. This failed as none of this additional information was relevant to evaluating the degree to which the past performance examples given reflect performance of projects similar in size, scope, and complexity to the requirements of the solicitation.

Weaknesses assessed: GAO sustained the protestor's arguments on some of the weaknesses it asserts were unreasonably assessed to its proposal under all four of the non-cost/price factors. GAO determined that there were weaknesses assessed against protestor that were unreasonable, inconsistent with the terms of the solicitation, and which the agency failed to adequately document. It found that the agency's responses were vague and did not meaningfully explain the assessment of the weaknesses given. The first weakness GAO determined was improperly assessed against protestor was under the technical and management approach factors and was for its failure to show it was the best approach. The solicitation did not require an offeror to show it was the best. The second weakness that GAO found was improperly assessed against the protestor was the weakness given for protestor lacking "soft skills." The Technical Evaluation Board (TEB) assessed this weakness under the management approach factor whereas the selection official assessed the weakness under the technical approach factor. The agency could not provide an explanation for this discrepancy. It did provide an explanation to why the weakness was assessed under the management approach factor but did not explain how that related to the technical approach factor requirements.

GAO found for the protestor because the discrepancy between the selection official and the TEB was

undocumented and because the agency record did not support the claim that the weakness was reasonably related to either the technical or management approach. The third weakness GAO determined was improperly assessed was in the experience factor and was attributed to an inadequate number of full-time equivalents that protestor proposed for help desk. GAO found it improper that the agency looked to its own estimates of staffing levels required for performance to be satisfactory but did not disclose its overall staffing estimates to the protestor. The agency also failed to conduct discussions regarding the discrepancy and did not look beyond the bottom-line numbers when evaluating. The overall staffing was not addressed by the TEB but only by the selection official in the award determination. The fourth weakness GAO determined was improperly assessed against protestor was under the management approach factor and was for protestor showing a lack of diligence in its initial quotation even though it revised the quotation and, according to the agency, was able to show a better understanding. GAO found that the agency acted unreasonably considering there were discussions and the initial quotation was revised.

Best value trade-off: Finally, GAO sustained protestor's argument that the agency's best-value tradeoff decision and award was unreasonable and inadequately documented. Its basis was that there were numerous evaluation errors addressed in the protest and the agency failed to adequately document its decision. For the most part, the record failed to show any discussion about the qualitative aspects of the quotations. The GAO could not see where the agency looked meaningfully at awardee's quote as being the best value. It was the higher-priced quote and there was simply no evidence to support award of the price premium

Unequal Treatment

GAO cited ManTech Advanced Systems International, Inc., B-416734 for its example of where an agency, Department of Homeland Security, U.S. Immigration and Customs Enforcement, exhibited unequal treatment. In this case, GAO sustained the protestor's argument that the agency unequally evaluated its quote. The agency evaluation assigned awardee and protestor acceptable ratings under the non-price factors. Award was not made to protestor even though its quote was approximately \$1.2 million less than awardee because the agency thought that the awardee offered the best value. The work required the contractor to provide senior-, mid-, and junior-level intelligence analysts, and there were experience requirements and clearance requirements for each. The offerors were required to demonstrate competitive methods of personnel retention for junior personnel and then as a separate requirement were to demonstrate competitive methods of personnel retention for qualified and cleared personnel. Protestor's quote

did not detail retention techniques that were specific to any type of personnel but that seemed to apply to any of its employees. GAO found that the agency was reasonable in determining this to be a weakness. GAO also found that the agency acted reasonably in determining the second weakness, which was protestor's use of career development as a retention technique. The agency acted improperly when it did not assess the same weakness to awardee who also used company-wide benefits as retention techniques for cleared personnel. GAO determined that the agency did not have a basis to evaluate the quotations disparately and this resulted in competitive prejudice.

GAO dismissed the protestor's argument that the agency improperly made its source selection decision. Protestor's argument was that its lower price was a determining factor because the quotes were equally rated under the staffing approach factor. GAO found that the solicitation did not indicate price was a determinative factor in any scenario. The language in the solicitation that "price becomes more important" did not mean "becomes determinative."

Unreasonable Cost or Price Evaluation

GAO cited Shearwater Mission Support, LLC, B-416717 as its example case of an unreasonable cost or price evaluation. In this case, the GAO determined that the agency, the Department of the Navy, Naval Facilities Engineering Command, performed an improper price realism analysis leading it to conduct misleading discussions with the protestor. The solicitation was for an 8-year fixed-price contract consisting of a 1-year base period and seven 1-year option periods. The solicitation advised offerors that there were five non-price factors that would be evaluated: recent, relevant experience of the firm; technical approach; management approach; safety; and past performance on recent, relevant projects. The first four factors were of equal importance to the past performance factor and all when combined were approximately equal to price. The protestor argued that the evaluation terms of the solicitation authorized a price reasonableness evaluation, not a price realism analysis. GAO agreed citing ERIMAX, Inc. B-410682 (January 22, 2015) for the premise that agencies are not required or permitted to conduct a price realism analysis evaluation when awarding a fixed-price contract unless there is a solicitation provision providing for one. In this case, the solicitation did not allow for a price realism analysis.

The agency believed that it did not perform a price realism analysis. GAO disagreed based on how the agency conducted its evaluation. In its evaluation, the agency compared proposed prices (called annexes) to the Independent Government Cost Estimate (IGCE). It applied a percentage variance to determine if a proposed price was unreasonably low or high. The agency conducted the same evaluation when it received final proposal revisions (FPRs),

resulting in its requesting second FPRs. GAO deferred to the contemporaneous evaluation record, which is of note as it gives GAO a window into the decision-making thoughts and processes of an agency during an acquisition process. Therefore, it is given significant deference. In this case, the contemporaneous record showed that some of protestor's prices were considered unreasonably low because of the concern that they were "unrealistic" and "may increase performance risk or indicate an inherent lack of understanding," which are features of a price realism evaluation. In contrast, a price reasonableness evaluation does not determine whether a price is too low.

Misleading discussions: The protestor responded to discussion questions with the agency regarding its initial proposal and FPR that led the protestor to increase the prices that were identified as unreasonably low. The price adjustments ultimately resulted in its proposal being greater than awardee's. The higher price was the primary reason the protestor was not selected for the contract award. GAO found for protestor as it could prove that its

price was increased as a direct result of the discussion questions, which were based on an improper price realism analysis. The protestor's price increases directly correlated to its price being higher than awardee's. As a result, protestor was misled to its disadvantage.

Conclusion

From year to year, we face consistent themes on how evaluations should be conducted. It is sometimes difficult to see where our evaluations may not comply with GAO expectations. The example cases provide a few scenarios that may be useful to compare with our current procurements. Taking these decisions into account, we can perhaps avoid making some of the same errors in our evaluations and award decisions. Creating a fair and transparent procurement environment, affording meaningful discussions, and adequately documenting the record are a few of the repeated best practices that we can hope will reduce the number of future protests sustained by GAO.

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