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Challenge and Change in Supply Chain Management

Pointed Questions and Blunt Answers

Lt. Gen. Claude V. "Chris" Christianson, USA (Retired), Former Joint Chiefs Director for Logistics, Takes Tough Questions from ICAF Students

ALSO

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Errata
Please note the corrected volume, issue, and DAU catalog numbers for the prior two issues: March-April—Vol. XL, No. 2, DAU 219. May-June—Vol. XL, No. 3, DAU 220.

I would like to thank the authors of "Analyzing Generation Y Workforce Motivation" (March-April 2011) for the article and their timely research.

As research is intended to do, the article brought to mind a potential follow-up question: Are the differences in the ratings that the three groups (Generation Y, Generation X, and Baby Boomers) assigned to the five motivational factors attributable to changes in society, or are they a function of individual growth and maturity in any era? Knowing this might tell us something about how and where we should be spending our time and money on recruiting, training, mentoring, career development, etc.

Thanks again to the authors, Ian Barford and Patrick Hester, for their excellent report and to *Defense AT&L* for publishing their research.

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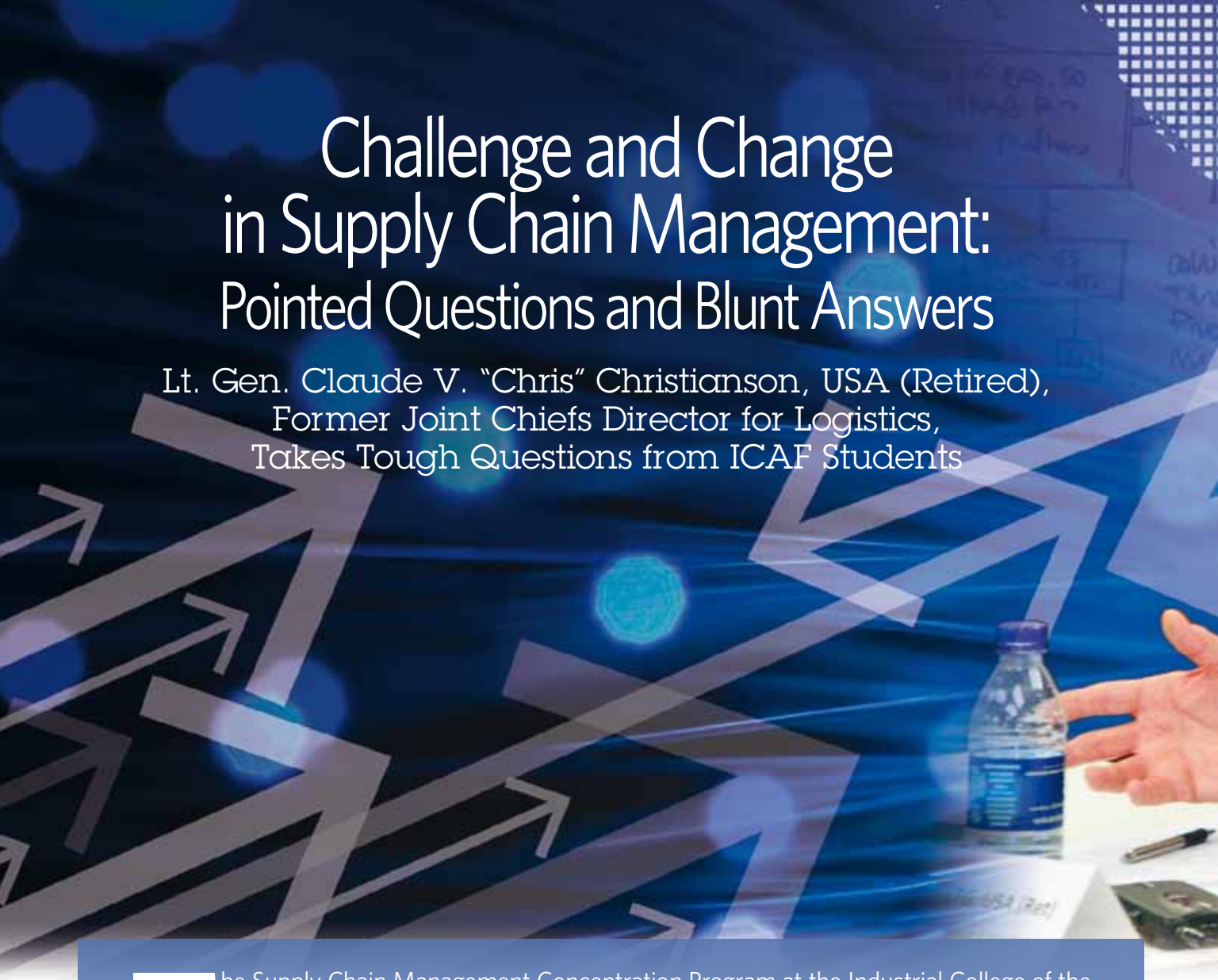


Challenge and Change in Supply Chain Management: Pointed Questions and Blunt Answers

Lt. Gen. Claude V. "Chris" Christianson, USA (Retired), Former Joint Chiefs Director for Logistics, Takes Tough Questions from ICAF Students

The Supply Chain Management Concentration Program at the Industrial College of the Armed Forces is one of the most demanding and highly regarded focused study programs in the DoD education system. This year, 36 senior officers, government civilians, and industry fellows are participating in the year-long experience, which includes the opportunity to interact with senior officials and supply-chain experts from military and civilian organizations. After retired Army Lt. Gen. Claude "Chris" Christianson's presentation to the class last fall, they asked that he be invited back for a no-holds-barred, 2-hour, one-on-36 Q&A session about critical supply-chain issues in DoD. Their intent was to ask their toughest questions about the most vexing issues for the department's senior logistics leadership.

Christianson readily accepted the role of target to a room full of sharpshooters. No amateur at defending his views, Christianson has long been noted for his candor, strongly held opinions, and willingness to engage and discuss

Retired Army Lt. Gen. Claude V. "Chris" **Christianson** *is director of the Center for Joint and Strategic Logistics, a research organization of the National Defense University, which helps logisticians gain proficiency in applying logistics support across the national security enterprise. In his 37 years of Army service, he has served as director for logistics on the Joint Staff; the Army G4; and chief of logistics, C4, Coalition Land Forces Command, in Operation Iraqi Freedom. He also served as J4 for U.S. Forces Korea; deputy commanding general, 21st Theater Support Command; and chief of the Office of Defense Cooperation in Rome.*

his views with anyone; he is frequently called upon to speak at events around the nation and the world. Having served 37 years on active duty with tours as both the Army G4 and the Joint Chiefs of Staff J4, as well as assignments as a C4 in three operational theaters, including as the Coalition Forces Land Component Command C4 for Operation Iraqi Freedom, he is particularly suited to discussing these isssues.

The Feb. 9, 2011, session turned out to be one of the most valuable classes in the entire supply chain program and lasted well beyond the 2 hours allotted, with several questions—and ensuing debates—left unfinished. The National Defense University (NDU) received such a favorable response from the students on both the quality of the questions asked and Christianson's responses that it submitted the Q&A in its entirety for publication in *Defense AT&L*. NDU did so for the benefit of not only the logistics career field, but also for the other acquisition career fields whose activities and mission are so often cross-functional with supply chain management.

[Ed.: Questions were provided in advance; some responses are partially from notes Christianson had prepared and have been adjusted based on the actual discussions during the Q&A session.]

People and Leadership

Q: When we strive for efficiency, we can only be as efficient as the political process allows us. Why don't we see more senior leaders pushing back on Congress when we know that certain things we are developing/buying/doing are only a result of congressional pressure (such as earmarks) but are of no or limited value to the procuring Service?

Christianson: I recommend against wasting your energy here, because we will always have earmarks, and we will always have congressional pressure. Your job is to ensure that we, as a nation, get the most from every dollar, regardless of where it comes from or where it's applied. You should always focus on conserving the resources we have and doing what you can to ensure

that we are positioned to support future requirements. As for "pushing back," each leader has to determine how hard and how far to push based on the previous two sentences; it won't be the same for everyone.

Q: How can we better integrate logistics and acquisition professionals (besides having them receive the same ICAF curriculum) to improve the overall success of a supply chain?

Christianson: This is a question that could consume this entire session—and I hope will be a focal point for your studies here and your professional efforts in the years ahead. In a nutshell, we should do this by implementing policies that merge acquisition and sustainment in a way that delivers the required operational capability over the life of our systems at best value to the nation. I suspect we will spend much of our time today on issues related to this question. At the end of the day, the acquisition and sustainment communities must come together on this issue. I don't see strong indications of that today.

Q: What do you think of the Army's decision to exacerbate the separation of ACQ officers from their operational peers by removing them from Command and General Staff College (CGSC) and having them attend an Intermediate-Level Education (ILE) program? Do you think ILE was the right way to go?

Christianson: I'm not familiar with this action. I view ILE and CGSC as being at the same level of education. If there was a decision by the Army to take the acquisition students out of ILE to send them to their "own" intermediate school, then I think that was a mistake. There is a need for all specialties to spend time learning in their specific profession, but the more we separate our specialties, the more difficult it becomes to work in an integrated, coordinated manner.

Q: What do you think about the Army Acquisition Corps? Should the Army disband it (if it legally could) and return its 1,477 officers to the operational force?

Christianson: The Acquisition Corps is essential; our defense establishment could not survive without them. However, I do not think that, as a group, they should be viewed as separate and distinct from the operating forces. We should regard—and manage—acquisition professionals more like critical enablers/integral members of the team. I think our biggest challenge is to find better ways to connect the acquisition process and its professionals to the operating force and its requirements.

Q: Workforce downsizing has hurt our ability to define requirements, generate independent government estimates, and evaluate industry proposals. What can DoD do to retain/regrow these capabilities amid pay/hiring freezes?

Christianson: If we can change the processes, better integrate acquisition and sustainment, and establish true life-cycle partnerships with industry, it may well be that we won't need as many people to accomplish the tasks you've identified. In other words, if we can change the business model, maybe we can become way more efficient in doing business.

Life Cycle Systems Management

Q: With the advent of numerous rapidly fielded systems to support urgent operational needs, systems flowed into theater without full consideration of the impact to sustainment and life cycle costs. What steps can DoD take to better integrate ad hoc maintenance and sustainment efforts for unforeseen requirements?

Christianson: All systems have to be viewed through the lens of life cycle systems support. If the "normal" process (5-year defense programs [FYDPs], for example) will not support the need to rapidly respond to a changing operational environment, then we will have to find ways to effectively integrate emergent support concepts into the larger whole. I believe we will always have to work "outside the system" at times to meet urgent needs, so we must find a better way to rapidly integrate urgent, rapid acquisition with life cycle sustainment concepts. Once again, this exemplifies why merging acquisition and sustainment becomes so important for long term viability of our systems/capabilities.

Q: As wartime commitments decrease, what strategies should DoD use to dispose of or store these systems as they compete for funding with established programs of record?

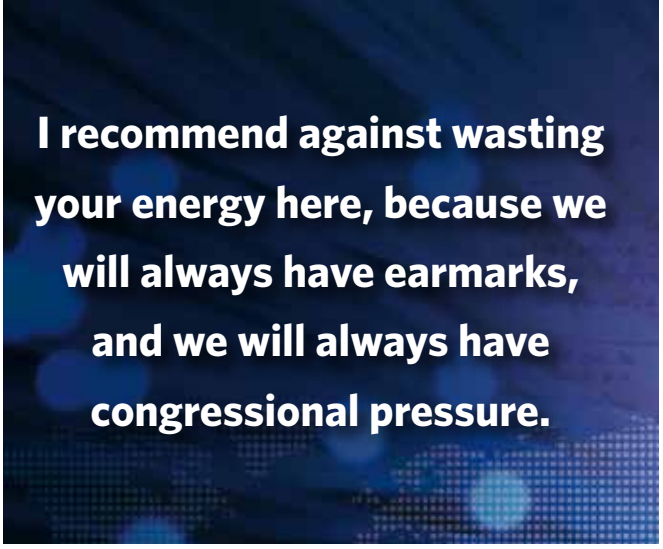
Christianson: It will be critically important for the department to start by agreeing on the joint requirements—"What will the joint force need to meet future operational imperatives?" Allowing the Services to determine what they need absent a "joint requirements framework" could result in unknown risks and will most likely drive the development and retention of unnecessarily redundant capabilities.

Q: How do we establish a life-cycle emphasis when working supply-chain issues?

Christianson: First we have to agree on what "life cycle" is. It is important that we agree upon the outcome we must deliver, how we will determine total ownerships costs, and what time horizon we will use as an expected useful life for decision making. I believe it is also important to continually/periodically review the assumptions we've made to revalidate our operational requirements—do we still need this equipment?—and to verify that it will "cost-effectively" perform its mission as long as we "predicted."

Q: The Air Force has stated it would like to change the support contract for the C-17. What are the issues involved, and how can DoD and Boeing be better partners?

Christianson: There are many issues here, but I think the primary ones are related to costs and organic depot capacity.



These issues are exacerbated, I believe, by the misplaced belief that everything contracted is more expensive—or if you're a contractor, everything in the government is more expensive. This is related to the next four questions and requires that we (both government and industry) develop the ability to evaluate our national supply chain requirements in a new way.

Q: The Navy and the Air Force recently stated they would like to make changes to the Joint Strike Fighter sustainment arrangement with the contractor. The Air Force and Navy would like to have more of the sustainment supply chain organic to the Services rather than be a performance based logistics arrangement. What are the support and readiness implications for the Joint Strike Fighter? What might be the life cycle sustainment issues and costs of making changes now to the sustainment plan?

Christianson: If done right, we should be able to achieve the system availability we need at the best value/cost to the Service. If, however, we do not share a common denominator, cannot see the total ownership costs over time, have hidden costs, etc., we will end up delivering a system that could very well be unaffordable. The key, then, is to bring government and industry together to develop a common picture, look at options, and work together to develop a partnership that shares both reward and risk over the life cycle of the system.

Q: Should the military direct consolidation of engine refurbishment/depot-level repair capabilities at select depots? What are the pros and cons of such an action, which will take business away from installations?

Christianson: First of all, any depot repair, regardless of where it's being accomplished, is supposed to be approved by the materiel command responsible for that item. I do think that all national maintenance should be done in approved national facilities (government or contract) and "taking business away from an installation" should not be viewed out of the national level, life-cycle-systems context. If an installation can meet the system's national standards and show a business case that provides value over the life of the system, they certainly can and should compete for that work. However, I would be very surprised if there are many installations that can truly meet national standards. I do know there are installations that have been doing national-level (depot-level) work for some time, and many have been doing so without oversight of the national maintenance programs.

Q: As you know, there are discussions of closing depots (due to BRAC) and a struggling industrial base. Other discussions suggest that there may not be enough business for the depots post Operation Iraqi Freedom (OIF)/Operation Enduring Freedom (OEF). Can depots/should depots compete for private-sector business in order to sustain depot capability? For example, should Anniston Army Depot rebuild engines used by private companies? Doing so would sustain the necessary skills and depot capabilities—possibly at reduced cost compared to that which private companies might charge at private firms.

Christianson: This question is somewhat related to the previous question, but I think there are a couple of issues here. First, and most importantly, I'm not sure that as a nation we know how much government-owned depot capacity we need to deliver the systems operational availability we require. Since many of our government-owned depots are being funded out of Overseas Contingency Operations money today, there is a danger that if we are not clear on what the base requirements are, we may not identify enough funding in the Department's base budget for future years. Once we determine how much government-owned capacity we need, I believe we'll find that there won't be a lot of excess out there. However, if we do have excess capacity that we feel must be retained for reasons of national security, then I do believe that the government-owned depots could compete in the commercial space. However, there will certainly be some legal issues to face regarding a level playing field.

Q: BRAC 2005—are we going to realize the expected benefits once the changes are fully implemented, and is this just an interim step toward an even greater degree of jointly managed, owned, and operated logistics systems?

Christianson: We will not even come close to achieving the estimated benefits unless we change the way we do business. The BRAC activity at Warner Robins Air Logistics Center is a case in point. We are struggling there to realize the savings because we haven't fundamentally changed our business processes between the Air Force and the Defense Logistics Agency (DLA). The BRAC intent in this example was to bring the supplier (DLA) right to the Air Force production line. Like in the commercial space, this would require the supplier to be vested in the manufacturing process and the Air Force to be open and transparent with the supplier. We are not there yet. In general, I do not believe that BRAC is just a step toward a more jointly owned and operated logistics system. I believe, rather, that it should be a step toward a more integrated and optimized supply chain across the entire defense logistics enterprise.

Supply Chain Management

Q: Why can't DoD develop one supply system that can utilized by all four Services? How integrated should the robust DoD and interagency supply chain be, considering efficiencies to be achieved through NORTHCOM [U.S. Northern Command] as well as security limitations?

Christianson: I don't believe it is realistic to expect that we can design and sustain a single system for everyone. The Services have some uniqueness to them that should be retained, and fundamentally, I believe the Services know better than anyone else how best to do their business. So I don't think we need, or should pursue one system—if by system we mean an application. One could argue that we should have one "process" that is shared by all, and we should be able to make it work much better than it does today. The key here is developing a data architecture that enables the sharing of logistics information across the entire supply chain and coalesces the logistics community around the common outcomes we want to achieve. We don't need one supply system to do that.

Q: What changes to the supply system do you recommend for improving supply support at the "last tactical mile?" What policies, relationships, organizational structures need to be changed to maintain readiness and reduce costs?

Christianson: First, link in real time the customers' consumption to the source of supply. Next, enable 100-percent visibility into our distribution process. And last, measure fulfillment of the requirement at the customer end of the supply chain. When you have completed these tasks, come back and see me, and show me the results. I will be very impressed, and so will you!

Q: Demand variability is seen by many executives today as one of the major challenges to improving supply chain performance. What can and should the DoD supply chain managers do to improve response to demand and account better for variability?

Christianson: Variability will always be a given; we all know the future is uncertain, so we have to expect variability. The key is not trying to just "manage" variability, but to design your supply chains to be able to efficiently respond to those requirements that have a reasonable chance of prediction, and then responding rapidly and with precision (effectively) to the emerging/unexpected requirements as they're generated. In other words, do not treat all supply requirements the same, and do not design all supply chains the same.

Q: I would like to hear your comments on DoD supply chain security. How do we deal with the counterfeit parts and tampering issues? These are exacerbated by globalization of the supply chain, procurement policies driving buyers to "lowest cost" suppliers, and diminishing sources of supply. What policy revisions or best practices should DoD implement?

Christianson: I think we have to modernize our sourcing processes to ensure that we understand the elements of risk in the supply chain, establish some methods to assess that risk, and then have the kind of contractual instruments that will enable us to manage the risk as the environment changes. I'm not sure that, today, we actually use risk as a criteria for supply chain design or for source selection in the supply chain.

Q: I would like to hear your thoughts on whether DLA should start restocking rare-earth elements to potentially sell to our defense contract suppliers if needed. This would be akin to our strategic oil reserves. As we have seen during many of our supply chain trips and the case studies we have reviewed, the ability to react to customer demand and having a supply chain that can respond quickly is critical. The military uses prepositioned stock and equipment to ensure it can react to real-world crises. As future logistics leaders of military and government agencies, what issues do we need to be aware of for prepositioned equipment to ensure our supply chain can respond to future crises?

Christianson: DLA is and has been stockpiling critical material and supplies such as rare-earth elements; it's in their charter. Stockpiling, strategic reserves, and prepositioned supplies/capabilities should all be related to how well we are able to assess global risks, what kind of action we take to position global capabilities in response to that risk, and then how effectively we are able to manage our global assets as the environment changes. The bottom line is that we must share a common view of what the nation expects of our military capabilities (requirements) and then design our supply chain to minimize the risk (acceptable risk) in support of those expectations.

Q: Does DoD's wholesale supply chain need to sacrifice effectiveness as it strives to become more efficient in lean fiscal times, or is there a happy medium?

Christianson: There is a happy medium, but it should not be viewed as a template solution. The first part of the question implies that effectiveness and efficiency may not compatible—i.e., it's an "either/or" decision. Our supply chain cannot put effectiveness at a high degree of risk; I would offer that only the customer (operational element) can make a change in the effectiveness outcome (operational availability). However, the design of the supply chain to support operational availability of "X" at a fixed base in the U.S. should not look the same as the supply chain designed to support the same operational availability at a forward operating site in another country. The objective is that, even though the outcome metric (availability) is not a logistician's call, it is the logistician's responsibility to optimize the network and the costs to deliver that outcome, and to ensure that all costs are transparent and accurate so that the operational element can make informed decisions.

Q: I would ask what the COCOMs can be doing to improve partner capacity in developing nations (such as those in Africa) in the logistics arena.

Christianson: First of all, the COCOMs' theater engagement strategies drive the train in this area. Fundamental to that is building an understanding first of what your regional partners need to help themselves and then what the United States' objectives are in that region. Then, match the two to find the best ways to enhance both parties' capabilities/needs.

Q: How do we obtain visibility of joint and multinational requirements and capabilities/resources and leverage the latter against the former across all forces?

Christianson: We start first by establishing a collaborative planning environment where the members of the team (whoever they are) can be a part of the process. In execution, we have to create a shared decision support environment so leaders can make the best decisions.

Contractor Support

Q: DoD relies heavily on contractor support, like LOGCAP IV, training, and private security services. With defense budgets reducing and Operation New Dawn/OEF operations eventually coming to an end, how do you see the health of the defense industry? And will it remain a viable alternative to DoD in terms of maintenance, supply chain management, and combat logistics training?

Christianson: I believe we will see some significant shrinkage in some of the service providers like LOGCAP, but overall there will continue to be both a viable and necessary requirement to have contract support as part of our support concepts. As I have mentioned, we need to plan for this capability to be an integral part of our support concept, assess the risks and comparative "costs," and make effective decisions about where and how to source support to provide the highest possible readiness at best value. Last, it is important that we not view all contract support through the same lens; service support from contractors like LOGCAP should not be approached the same way we approach contract support for systems readiness, for example.

Q: If outsourcing remains a viable alternative for DoD, is there a second- or third-order effect to DoD's ability to sustain its own competencies in the areas for which contractors provide support, such as maintenance operations, supply operations, depot operations, mission skills, training, etc.?

Christianson: This question gets to some of the fundamental issues related to contracting—issues we haven't yet come to grips with. As noted earlier, we must assess the risks of delivering capabilities by contract. Are there, for example, some things that the military must always do? Are there some tasks that are always best done by contract? For the rest, under what conditions can we use contract support, and what operational effect will that have? Without answers to these types of questions, we cannot really know the second- and third-order effects that may result.

Q: Outsourcing or "Alternate Service Delivery (ASD)" in the areas of operational support in theater to maintenance in CONUS—what have the Services learned from, let's say, the last 10 years of outsourcing (ASD) to private contractors and firms?

Christianson: I think we've learned that contract support is a valid requirement for operational sustainment. We've learned that we still aren't very good at using contract support under crisis because we: (1) continually try to use peacetime rules in the operational environment; (2) do not do well in the transition from a steady-state, peacetime-support construct to an operationally driven, outcome-focused construct; (3) have not built an effective expeditionary capability in this area; and (4) do not really look at operational contract support as a joint capability requirement.

Q: Is the U.S. taxpayer receiving value in these relationships?

Christianson: It depends upon our baseline. In most cases, I would say that we are receiving much more than we've paid for. However, that's not always the case. I think the challenge is how we "measure" success. If our metric is based on rules and procedures designed for peacetime, regional contracting offices, we will rarely, if ever, meet the standard in the operating environment.

Q: Has ASD been taken too far?

Christianson: Maybe. In some cases, we may not have done a good job of assessing the operational impacts of our outsourcing decisions. There are cases where we have made an enterprise decision regarding ASD that has not been translated into operational expectations. In other words, the enterprise capabilities may not be aligned with what commanders in the field want.

Q: Are there now known and better understood constraints/restraints associated with ASD in the areas of supply chain, provision of services, and equipment maintenance?

Christianson: There is no doubt that we know more about this today than we did 8 years ago, and that's a good thing. But we have a long, long way to go, and that's one of the reasons you're here.

Q: I'd be interested in your perspective on the near-term and long-term likelihood of the Services using Performance Based Logistics (PBL) contracts. I think people often associate PBL contracts with contractor support services contracts. I see a difference in that PBL contracts have defined deliverables and performance criteria by the Original Equipment Manufacturer, but I see other types of support contracts (such as service contracts) as basically staff augmentation. Maybe I'm confused, but any additional insight you can provide on the differences (perceived or not) would be educational for me.

Christianson: I don't think the question's premise is correct. All contracts should have defined deliverables—ideally, deliverables that meet the customer needs. The difference in PBL contracts is related to "performance," and the basic philosophy is to enter into an agreement with a contractor based on the performance outcomes the customer wants. The PBL contract would then have both customer and contractor share in the delivery of that outcome. So I would recommend that we look at all contracts through the PBL lens; I'm not sure why anyone would want anything other than a contract based on a performance agreement between customer and contractor.

Even something like a staff augmentation contract can be written like a PBL contract. There is risk associated with clarity in this area. Over the near term, there is a risk from a lack of understanding about how PBL can provide value. Over time, I feel the risk will be reduced because we will develop the kind of knowledge needed to establish true partnerships with industry—partnerships that will be reflected in new, more effective PBL agreements that will: (1) ensure we deliver readiness at best value; (2) incentivize the behaviors we want to drive down life cycle costs; (3) provide assurance of reasonable profit to industry (shared risk and reward); and (4) provide best value to our nation.

Information Technology and the Supply Chain

Q: Enterprise Resource Planning (ERP) systems are vastly more expensive and harder to implement than initially projected. An IT contractor told me off the record 2 weeks ago that the DLA ERP program is now about 75 percent custom coding. Can we leverage our ERPs to get an acceptable (to Congress and GAO) return on investment when we're still forcing commercial software to model our processes, rather than more fully adopting and adapting commercial practices?

Christianson: No! We will only get acceptable returns if we change the way we do business.

Q: We are reliant on information systems, and the Services are investing heavily in ERP solutions. Are these investments needed? How are we going to continue to fund these solutions? Are we going to "re-engineer" our processes? Anniston, and I believe the Army, is having issues with integration of the Logistics Modernization Plan (LMP). We visited the new Power train/Flex Maintenance Facility—a nearly $76 million facility designed to overhaul 6- to 12-cylinder internal combustion engines—not tanks, engines. State of the art. The problem is with LMP. It appears software-integration issues caused a stop-work order for the past 3 weeks, and they are not yet sure when they will start up work again. Way-ahead plans seemed to be lacking definition. Also, we learned that this new facility is still competing with installation DOLs.

Christianson: The investments being made in enterprise solutions are essential; however, if we are not willing to change the way we do business, those investments will not provide the benefits we want. The Anniston example is but one of many across the DoD logistics community where we have tried to apply a commercial application of a business process and then customized that software to meet our old way of doing business. Over the long run, that approach will not work; it is too expensive and does not support modernization of our business.

Q: What is the way ahead for completing the integration of LMP at the depots and across the Services? What happened that caused the issues currently ongoing?

Christianson: The issues surrounding LMP are a reflection of [the issue raised in] the previous question and emblematic of our failure to heed the lessons of business in ERP implementation. In this case specifically, we asked LMP to replace two existing depot software applications that had been designed back in the '70s. And as a result, nearly all of the LMP (SAP) code had to be customized. However, 40-year-old business processes have long been supplanted in the commercial space. In other words, we weren't willing to adjust our processes to fit the application we bought. Additionally, we didn't own the code, so it was not possible to take the best and leave the rest. To make this even more complicated, when SAP updates its software for the commercial market, we can't just update our LMP; we will have to spend lots of time and money revising our custom code to ensure we're up to date.

Q: Why do you see automated information technology (AIT) adding little value to DoD supply chain management?

Christianson: I see AIT adding tons of value if applied in ways that will enable decision making across the supply chain. At this point, I'm not sure we have actually come to an agreement on exactly how AIT is going to help us make better decisions. We have had a tendency to buy AIT technology without considering the decisions we wanted that technology to enable.

Organizations

Q: Should Transportation Command (TRANSCOM) and DLA be combined into a "supply chain" command?

Christianson: I do think the United States should have a global support chain organization—but I do not believe that TRANSCOM is that organization. However, I do believe TRANSCOM should be the headquarters around which we should design that organization, and it would include what is today DLA. But this would not work if all we did was merge DLA with TRANSCOM; we would not gain the benefits many feel we deserve and could achieve. The problem we're trying to address, I believe, is the effective and efficient integration of the defense supply chain. We should create an organization to do just that.

Q: Should logistics forces be tasked/allocated in the Joint Forces Air Component Commander (JFACC) fashion under a joint logistics commander or under the Combatant Command/Joint Task Force (COCOM/JTF) commander through the J4? What are the pros and cons?

Christianson: Joint Publication 4-0, Chapter 5 tries to address this issue. The publication explains that it depends upon what has to be accomplished and the context in which the mission has to be executed. For small operations, for example, the J4 staff can handle the integration of joint logistics support, and if that staff is augmented, it can deal with some pretty good-sized requirements. However, a coordinating element with the authority to task component resources will best serve those operations that are beyond the reach of an augmented J4 staff. We can look at Joint Force Reception as an example of a joint operation where a single logistics element is a key to success.

Q: How can the DoD better posture itself to support humanitarian assistance operations where it does not have the lead role? Specifically, how can greater efficiencies be gained through a whole-of-government approach to sustaining interagency operations? Can you identify some areas that you feel DoD should improve on regarding the whole-of-government concept?

Christianson: First of all, we have to embrace our role as "supporting" commands! Then, in that role, we have to understand the requirements as seen through the eyes of the lead federal agency and align the military capabilities against those requirements. I do not see clear distinctions between humanitarian assistance/disaster relief (HA/DR) and other operations in terms of how we do our jobs; it is really performing similar functions in a different environment and with different teammates. One of the most important considerations is figuring out how to make it quick and easy to join the logistics enterprise and be included in the "network" supporting the HA/DR mission.

Q: What are the impediments to joint logistics operations in support of forces? How can the impediments be removed or changed to improve operations and reduce costs?

Christianson: The most fundamental impediment is the inability (or limited ability) to "see" the joint force requirements. The next hurdle is the limited ability to "see" all the resources available to the joint force. And last, there is a very limited ability to "see" the processes that connect the two. These impediments can be addressed by creating a collaborative space in both planning and execution where information is gathered to provide situational awareness and understanding for all members of the joint team.

Distribution

Q: After seeing operations at commercial distribution companies and comparing that to my two deployments to OIF I and OEF, it seems they have proven they have a competitive advantage for delivering supplies and equipment on a global scale. If we can get the appropriate country clearances and FAA approvals to land their planes in Iraq or Afghanistan, why don't we use this as our primary means of delivery for all cargo from CONUS to theater, providing both inter- and intra-delivery routes? My thought is twofold: We would eliminate deliveries from DLA in CONUS to Dover, Norfolk, Charleston, etc.—we could let these commercial firms move the product on their trucks/planes, allowing Air Force planes to focus on providing intratheater lift for passengers/personnel. This would also force DoD to simplify the DoD Activity Address Code (DoDAAC) system, reducing frustrated cargo.

Christianson: Much like the earlier point regarding the supply chain writ large, decisions about how to design the distribution network should be based on how effectively and efficiently we can deliver the outcomes we are chartered to deliver, given the level of risk we are willing to accept. Much like industry would build a business case, we have to do the same. It's not just whether these firms can deliver from A to B at less cost; it's whether using commercial capabilities will actually improve overall supply chain performance. Fundamentally, that is the responsibility of DoD's DPO [distribution process owner].

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Product Support and Human Capital

Essential Ingredients for Optimizing System Readiness, Availability, and Life Cycle Costs

Bill Kobren

"Traditionally, development and procurement have accounted for about 28 percent of a weapon's total ownership cost, while costs to operate, maintain, and dispose of the weapon system account for about 72 percent of the total. For a number of years, the department's goal has been to spend less on supporting systems and to devote more funds to development and procurement in order to modernize weapon systems. But, in fact, growth in operating and support costs has limited the department's buying power."

—*Setting Requirements Differently Could Reduce Weapon Systems' Total Ownership Costs*
General Accounting Office, February 2003

Kobren *is the DAU Logistics and Sustainment Center director. He is responsible for DAU logistics courseware and serves as Life Cycle Logistics Functional Integrated Process Team executive secretary.*

The affordability and efficiency initiatives undertaken by the Department of Defense in 2010 are prudent and necessary steps to proactively address current fiscal realities faced by the federal government during a period of increased financial uncertainty. We must "do more, without more," as Under Secretary of Defense for Acquisition, Technology and Logistics Dr. Ashton B. Carter has said. Given the portion of weapon system life cycle costs allocated to supporting and sustaining those systems, it is reasonable that the department would focus its efforts not only on reducing the portion of life cycle costs devoted to product support, but also on implementing initiatives to aggressively shrink the size of the pie itself, while simultaneously working to ensure that warfighter system availability and readiness requirements are met.

Reducing weapon system life cycle costs—like achieving warfighter performance requirements—is an endeavor that continues throughout a system's life cycle. Early in the life cycle, it necessitates a focus on identifying realistic, integrated, and achievable product support requirements; and once a material solution has been identified to meet a capability need, to design for and develop an effective and efficient product support strategy that optimizes system readiness and availability, while minimizing logistics footprint and life cycle costs. This, in turn, necessitates that weapons systems be designed, maintained, and modified to continuously reduce the demand for logistics; but when required, that the logistics support must be effective and efficient. In short, the resources required to provide life cycle product support must be minimized while still achieving warfighter performance requirements.

The DoD workforce responsible for achieving these product support outcomes must also:
- Identify and refine support requirements
- Advocate for the best design alternative
- Influence system design for reliability, availability, maintainability, and supportability
- Plan for, acquire, and field the system and its support infrastructure
- Conduct requisite business case analyses of product support strategy alternatives
- Develop, document, refine, implement, and regularly update the system's product support strategy in a life cycle sustainment plan
- Foster test and evaluation of the support system.

Life cycle management dictates that those activities do not end once a system is fielded, and in many respects, they are only just beginning. In addition to continuing to evaluate and refine the product support strategy, key post-fielding product support imperatives are:
- Maintain readiness
- Improve sustainability
- Support the user
- Adapt to support evolving requirements, mission employment, operating environments, and ops tempo
- Provide sustaining engineering support
- Improve the system and its support system
- Modify and upgrade system capabilities
- Minimize life cycle costs
- Proactively mitigate obsolescence and diminishing manufacturing sources and material shortages
- Plan for eventual system retirement, reclamation, and disposal.

The DoD Product Support Assessment

To assist in more effectively and efficiently achieving these life cycle management outcomes, in November 2009 Carter issued a report titled *DoD Weapon System Acquisition Reform Product Support Assessment* at https://acc.dau.mil/psa. This comprehensive assessment identified a series of wide-ranging "findings and recommendations needed to drive the next generation of product support strategies," including "eight principal areas that, if developed or improved, will make product support more effective and acquisition reform more far-reaching." One of the areas, not surprisingly, was human capital.

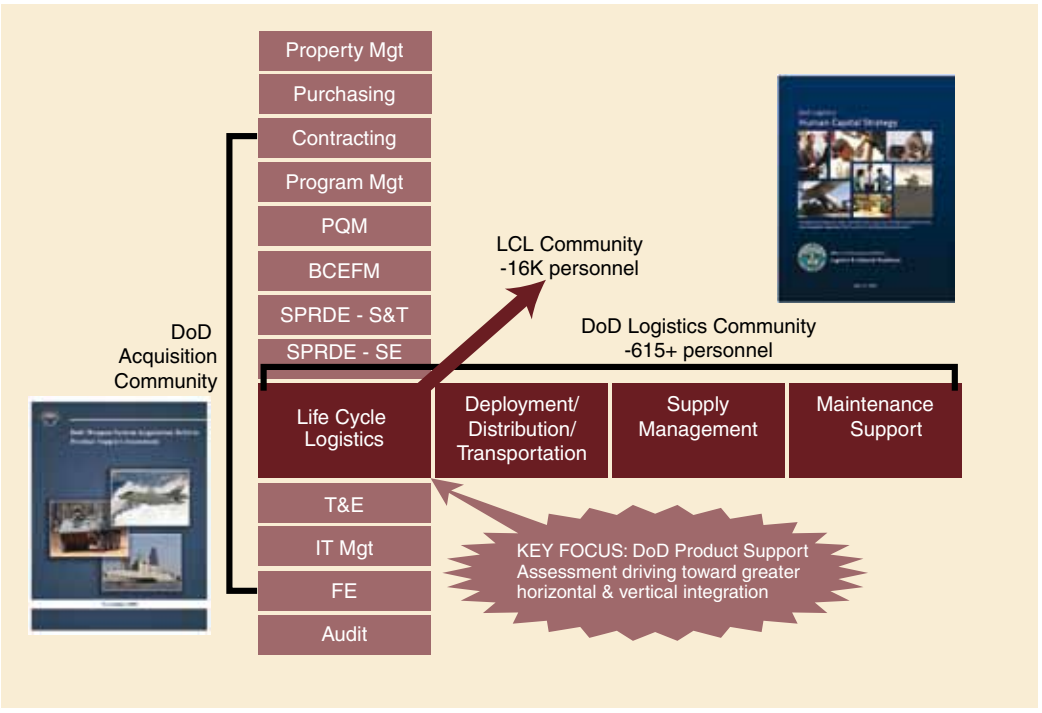
The report went on to say that "product support human capital derives primarily from two sources: the defense logistics workforce and the defense acquisition workforce," acknowledging in the process that DoD life cycle logistics "is most associated with product support competencies" and that the "life cycle logistics workforce stands at the nexus" of those two DoD workforces. While neither workforce demonstrates widespread product support competency across all career fields in the respective domains, the ability to achieve improved product support outcomes consistent with the recommendations of this report depends on a broader constituency capable of delivering efficient, cost-effective product support outcomes. The encouraging news is that the logistics and defense acquisition workforces are the beneficiaries of comprehensive and, in many cases, exemplary human capital strategic planning and workforce competency development initiatives over the past several years.

Key product support workforce human capital and professional development focus areas include life cycle product support and sustainment planning and management; life cycle cost management; performance-based life cycle product support strategy development, refinement, and implementation; supportability analysis; reliability, availability, and maintainability analysis; business case analysis, configuration management; and technical data management/product data management. While no substantial overlap is apparent between these key workforce product-support focus areas and those of the life cycle logistics workforce, weapon system product support is far broader than life cycle logistics, and indeed touches systems and sustaining engineering, business and financial management, cost estimating, program management, contracting, maintenance, supply chain management, distribution, and transportation workforce members as well. In fact, providing our warfighters with effective life cycle management and product support will ultimately touch virtually every aspect of

both DoD and commercial acquisition and logistics workforces in some way, shape, or form.

With this in mind, the Human Capital Integrated Project Team (IPT) was established in November 2009 to implement the challenging human capital recommendation articulated in the DoD Product Support Assessment report to "integrate product support competencies across the logistics and acquisition workforce domains to institutionalize successful traits of an outcome-based culture." The IPT's mission was to translate the report recommendations and, in conjunction with the Product Support Business Model and Governance Implementation IPTs, develop and implement an integrated approach to professionally develop a DoD and industry workforce capable of delivering successful outcome-based life cycle product support. To achieve this, the Joint Service team—consisting of product subject matter experts from the Components, Office of the Secretary of Defense, the Defense Acquisition University, industry, academia, the Defense Logistics Agency, and U.S. Transportation Command—has identified a series of 28 specific projects and initiatives in response to the following six overarching human capital "key tasks" outlined in the report:

- Identify new or modified product support competencies and proficiencies driven by proposed Department of Defense Product Support Assessment strategy, policy, and process changes.
- Incorporate new or modified product support competencies into DoD and industry logistics and acquisition workforce career field training, recruitment, and retention strategies.
- Identify potential assimilation requirements for supply management, maintenance support, and distribution/transportation workforce members into the acquisition life cycle logistics career field.
- Capitalize on Section 852 Defense Acquisition Workforce Development Fund authorities to grow and develop the future product support workforce.
- Expand integrated life cycle management training at DoD universities, public universities and institutions, and corporate universities.
- Update key DoD guidebooks and handbooks to facilitate defense logistics and acquisition workforce professional development and workplace application.



Competency Identification

Many of the individual projects and initiatives are intentionally being addressed in parallel rather than sequentially, although given its foundational nature, the first recommendation was the highest priority and is nearing completion of the four initiatives identified to implement the product support competencies and proficiencies human capital recommendation. Specific projects and initiatives identified to successfully address this key task include:

- Identify new or modified product support competencies driven by the Product Support Assessment. Review proficiencies contained in the June 2008 DoD Logistics Human Capital Strategy, *DoD Core Logistics Competencies and Proficiencies Booklet*, and the November 2009 Product Support Assessment report to identify any product support gaps, required additions, and/or elevation of proficiencies required to competency level.
- Finalize a list of integrated, multi-disciplinary executive-level product support and life cycle management competencies for designated defense acquisition workforce key leadership positions for use, among others, in crafting future defense acquisition workforce executive-level acquisition qualification standards and potential 400-level training for both the broader acquisition workforce, and also targeted at senior life cycle logisticians/product support managers.
- Conduct both a top-level and a detailed gap analysis to the terminal learning objective level between existing DAU learning assets and the June 2008 DoD Logistics Human Capital Strategy competency set for the four logistics workforce categories: life cycle logistics, identify new courseware/learning asset requirements, Defense Acquisition Workforce Improvement Act certification requirements, and core-plus training requirements.

Learning Assets and Guidebooks

Ultimately, the competency review and subsequent gap analyses are intended to identify strategic, functional, policy, process, and related training/learning asset changes in the future as a result of these Product Support Assessment recommendations. This will require new competency sets to be incorporated into the training curriculum and other workforce management activities.

Implicit in these competency identification efforts are tasks under other recommendations to translate these product support competencies into human capital professional development, training, and tools/resources to ultimately support a more proficient workforce. As a result, the team has identified and is working with the Life Cycle Logistics Functional IPT to develop and deploy a series of new and updated Defense Acquisition University learning assets to address these and related product support competencies, including deployment of new product support manager rapid deployment training and development of new LOG 340 Life Cycle Product Support and LOG 211 Supportability Analysis courses later in 2011, among many others.

In addition to the collaborative development of those and other courses, the team is also aggressively moving forward with developing up to 25 proposed continuous learning modules over the next several years on a diverse series of product support topics.

Working with the two other Product Support Assessment implementation IPTs, the Human Capital IPT is also assisting with the development, fielding, Web hosting, and incorporation into workforce training of a series of new or revised and updated guidebooks, including the *Defense Acquisition Guidebook* (updates); the *Product Support Manager's Guidebook*; the *Business Case Analysis Guidebook*; the *Logistics Assessment Guidebook*; and the *Integrated Product Support (IPS) Element Guidebook*.

Tools, References and Other Human Capital Development Initiatives

In addition to the aggressive training and guidebook development efforts, a number of other Human Capital IPT professional development initiatives are currently under way, including:

- Assisting the Defense Logistics Agency to smoothly and efficiently execute planned assimilation of nearly 3,000 personnel into the defense acquisition workforce life cycle logistics career field between now and fiscal year 2016
- Establishing a comprehensive Product Support Manager reference repository site on the DAU Logistics Community of Practice at https://acc.dau.mil/psm.
- Developing a new Product Support Manager's Toolkit to replace the existing Performance Based Logistics Toolkit at https://acc.dau.mil/pbltoolkit.
- Working with public and private sector academic institutions in addition to the Defense Acquisition University to address product support and life cycle management competencies and processes into workforce professional development and training. Among the many initiatives envisioned under this effort, the first involves initial planning in collaboration with the Center for Joint and Strategic Logistics at www.ndu.edu/CJSL/DOCS/CJSL-Purple-Book-Summary-091028.pdf for development of an executive-level life cycle systems management elective at the National Defense University.
- Development of a quick reference, Web-based, hyperlinked Life Cycle Logistics wall chart capturing key activities and deliverables throughout a system's life cycle. In 2009, in collaboration with DAU, U.S. Army Materiel Command Logistics Support Activity deployed a Web-based version of their highly regarded Life Cycle Logistics Wall Chart at https://acc.dau.mil/logsa/. The Product Support Assessment Human Capital IPT has undertaken an initiative to expand this Service-specific resource into a Web-based, Joint Service, DoD Life Cycle Product Support Wall Chart based on the Army chart.

Design for and develop an effective and efficient product support strategy that optimizes system readiness and availability, while minimizing logistics footprint and life cycle costs.

Where to From Here?

Effective and efficient product support planning and implementation is foundational to optimizing weapon system life cycle cost and performance outcomes. So too, is the need for a DoD and industry acquisition and logistics workforce that not only possesses, but is able to leverage the requisite product support competencies, tools, training, guidebooks, references, processes, and expertise to successfully achieve these two vitally important outcomes. Human capital is a fundamental and essential ingredient to delivering efficient and effective product support in support of our nation's defense; and the DoD Product Support Assessment Human Capital IPT is committed to ensuring the defense acquisition and logistics workforce has the requisite product support skills, training, and tools to achieving them.

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Making Sense of the Changing Global Supply Landscape

New Rules and Reformulations

Carole LeBlanc, Ph.D. ■ *Shannon Cunniff*

The global nature of military supply chains means that evolving chemical regulations throughout the world are triggering product reformulations and affecting the work of acquisition professionals. When defense contractors purchase from, and build for, a global market, the most stringent chemical regulations in the supply network drive the availability, use, and disposal of constituent materials in weapon systems and equipment. How can acquisition professionals successfully adapt to this changing global landscape?

The Law of Unintended Consequences

Currently, the most stringent chemical regulation is the European Union's (EU's) REACH (Registration, Evaluation, Authorisation, and Restriction of Chemicals) regulation. Although in its early stages of implementation, it is already driving product reformulations across the globe as industries move away from using known hazardous materials to inherently more benign ones. REACH, and other evolving international chemical regulations will increasingly affect the cost, performance, and schedule of weapons acquisition programs due to product reformulations.

For example, in July 2006, the EU promulgated a new regulation entitled "Restriction of Hazardous Substances" (RoHS), which limits the use of lead, mercury, cadmium, hexavalent chromium, and other chemicals in products. The restriction on lead prompted manufacturers to switch to lead-free solder alloys and pure tin termination finishes in a broad array of electronic equipment. Pure tin finishes develop "whiskers" that can short-circuit crucial electronics in aircraft and other critical military applications; and the reliability

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of lead-free solder alloys has not been proven in military and aerospace applications.

As a result, a major re-evaluation of military electronics has been launched and a new Army policy was developed that requires lead-based solder and finishes to be used in electronics. The director of the Office of the Assistant Secretary of Defense for Research & Engineering is identifying research requirements to understand the severity of the threat to the DoD mission and develop substitutes for leaded solder. Industrial partners most familiar with this issue have suggested an initial $100 million research effort in partnership with DoD and other agencies to address performance concerns.

Far more sweeping than RoHS, the EU's REACH regulation went into effect June 1, 2007. REACH replaces some 40 pre-existing laws in the EU Member States and neighboring countries. The goal of REACH is to register as many as 30,000 chemicals in 10 years with the ultimate purpose of authorizing or, alternatively, banning the use of a given chemical for a given application.

Originally conceived as a consumer protection law, REACH was promulgated to assess and limit the risks posed by exposure to hazardous chemicals, essentially asking the question: Is the use of a specific chemical warranted, given its inherent risks? The "burden of proof" for product safety is placed on the manufacturer. Under the REACH regulation, authorization is required to use substances of very high concern including: those that are carcinogenic, mutagenic or toxic to reproduction (CMR); persistent, bioaccumulative, and toxic (PBT) or very persistent and very bioaccumulative (vPvB) substances; and those causing probable serious effects to humans or the environment identified on a case-by-case basis, such as endocrine disrupters. Risks must be adequately controlled or a demonstration made that the benefits of using these substances outweigh the risks and no alternatives exist.

For consumers, REACH will undoubtedly lead to safer products over time. However, the extent to which the expedited adoption of alternate substances and articles will pose performance issues for defense-related systems remains to be seen. The REACH regulation does not contain a blanket exemption for substances necessary to the interest of military defense. Military exemptions must be pursued on a case-by-case basis by individual ministries of defense (MODs) within the EU.

"No Data, No Market"

The REACH regulation requires industry to demonstrate the safety of chemicals for each use before they can be made, sold, or imported in the EU. In some cases, smaller companies may decide to abandon a market rather than undergo the expense of obtaining this information. In other cases, changes in product formulation may occur without the knowledge or consent of DoD or the original equipment manufacturer, thus, posing technical performance issues (similar to the impact of the RoHS constraint on use of lead) as well as cost and schedule impacts. REACH will drive corporations, both manufacturers and downstream users, to new levels of supply chain management and accountability. While the United States is not subject to REACH compliance, many of DoD's industrial suppliers will be.

DoD REACH Strategic Plan Goals to Preserve and Enhance Military Readiness:

- Protect the Availability of Chemicals with Significance to the Mission
- Ensure the Performance of Substitute Chemicals with Significance to the Mission
- Guard Against Disruptions to the Defense Supply Chain
- Facilitate Defense Exemptions as Necessary
- Minimize Negative Impacts to Foreign Military Sales
- Assure that Defense Acquisition Strategies Meet Today's and Tomorrow's Warfighter Needs
- Capitalize on Environment, Safety and Health Opportunities
- Capitalize on Chemical Management Opportunities
- Plan for Future Regulations Impacting Chemical Use, Safety, and Availability

What the Acquisition Professional Needs to Know and Do

Multiple DoD components and commands will need to anticipate and respond to these complex chemical regulations to ensure the warfighter remains supplied and ready. To promote military readiness, the principal deputy under secretary of defense for AT&L issued a strategic plan for REACH in July 2010 (http://www.denix.osd.mil/cmrmd/upload/REACH_Strat_Plan_Signed.pdf).

The plan's nine goals aim to manage both the forseeable and unforseen impacts of REACH and leverage the opportunities REACH presents to reduce the total ownership (or life cycle) costs of existing and new DoD weapon systems and platforms. Each acquisition professional must identify and consider the risks associated with material choices in light of REACH regulatory requirements, shifting availability and material costs, and the possibility of chemical reformulations within the global supply chain. In an existing weapon system or platform, material choices may include the continued use of a REACH-regulated chemical or the adoption of a substitute chemical due to REACH restrictions. For new weapon systems and platforms, the relative risks of selecting a REACH-regulated versus a substitute chemical should be evaluated. Acquisition professionals must be especially alert to possible sustainment and transport issues, including compatibility of substances and articles with

equipment used by NATO defense alliance, and implications for foreign military sales pursued by DoD suppliers.

Where and how reformulated and substitute chemicals and materials are, or may be, used in existing weapon systems and platforms must first be established to ensure continued trust in their performance. Once this is determined, the impacts from using reformulated and substitute chemicals and materials can be assessed using a life cycle approach. For example, a substitute chemical, such as a lubricant, may meet performance requirements but degrade more rapidly, causing more frequent system maintenance to be required. Also, substitute chemicals may require process changes for their use; a substitute chemical may require a multi-step process to do what was previously done in one step. These types of impacts must be considered during the life cycle analysis.

Greater investments in testing and validating reformulations and alternate substances to ensure they meet performance standards will be required to comply with REACH. For instance, significant efforts are underway to test and qualify alternatives for hexavalent chromium-based materials used for corrosion prevention. In a recent case involving medium caliber gun barrels, research resulted in the development and testing of a tantalum/tungsten (10 percent) alloy coating bonded to the inner surface of the gun barrel. Gunfire testing demonstrated that the new coating extends the life of the barrel two- to three-fold, and may make it possible to use more energetic, higher-temperature propellants.

Furthermore, modifications to certain product performance specifications to prohibit the use of certain chemicals and substances or those that exhibit unwanted characteristics may be warranted to aid DoD in addressing REACH requirements. Performance specifications presently place few limitations on chemical formulations. For example, the formulation of a degreaser for DoD is typically dictated only by its performance as a cleaner. Any ingredient, even one that is a carcinogen or a flammable agent, may be used. The failure to prohibit these kinds of chemicals in these kinds of products has resulted in a wide range of chemical compositions being supplied under one national stock number/specification, some of which may contain ingredients that are not desirable and may not even be required for acceptable performance.

To ensure the integrity of weapons systems, protect supply chains, and guarantee uninterrupted support to the warfighter, acquisition and supply chain professionals need to stay informed and improve their understanding of the chemicals and materials used in or on DoD products and systems. DoD's strategic plan for REACH is geared toward identifying and minimizing disruptions to cost structures, schedules, and performance of the weapons systems and other equipment developed through the acquisition process.

One way to avoid long-range supply and acquisition disruptions is for DoD to consider the impact of REACH during the development of sustainment requirements for new weapon systems and platforms. The DoD has defined three mandatory requirements to ensure that effective sustainment is addressed and accomplished over the life cycle of all newly developed and fielded systems. These requirements include a key performance parameter (KPP), availability; and two key system attributes (KSAs), reliability and ownership cost. The availability KPP can be defined two ways—as the percentage of the total inventory of a system capable of performing its assigned mission at a given time or the percentage of time a system is operationally capable of performing. The probability a system will perform without failure over a specified interval and conditions is defined by the reliability KSA, while the ownership KSA considers operations and support costs over the lifespan of the system. Failure to adequately consider the potential impacts of REACH on these sustainment requirements could lead to increased system life-cycle costs and/or reduced system availability to the warfighter.

If a system under consideration is expected to use a chemical or substance regulated by REACH, the impacts of its use on the system's sustainment requirements should be considered as early as possible to help determine if its use is warranted or if design modifications should be considered. While this may require new approaches, careful research, and attention to changing regulations, the benefits for long-term sustainment of DoD assets may be significant. Considering the impact of regulations such as REACH on the sustainment of future DoD weapon systems and platforms may create a path to successfully meet KPPs/KSAs despite regulatory shifts that may occur over their life cycle. Life cycle environment, safety, and maintenance costs could be reduced and the potential for unintended consequences such as those that emerged with "whiskers" in tin solder and finishes be lowered.

The best way to manage risks is to lessen and avoid, to the maximum extent practicable, the planned use of hazardous and toxic chemicals. REACH presents opportunities to further green the supply chain and the systems acquisition process. DoD intends to capitalize on these opportunities through the use of high-performing substitutes and improved chemical management as it addresses these new challenges.

Resources for the Acquisition Professional

Tapping into REACH-associated updates from OSD (http://www.denix.osd.mil/cmrmd/ChemicalManagement/TSCA.cfm) and DoD's European Command (EUCOM) may help acquisition professionals anticipate cost and availability shifts of key materials and chemicals and ensure time for performance testing of viable substitutes. AT&L supply chain professionals can keep abreast of EUCOM, who is leading coordination of chemical-specific defense exemptions, as they communicate their positions. EUCOM, in collaboration with the EU's Defense Network (DEFNET), will track the positions of the MODs for the individual EU member states regarding implementation of REACH and requests for military exemptions. DEFNET helps the MODs ensure that defense interests are appreciated dur-

REACH in a Nutshell

Registration is required for all substances manufactured or imported in quantities of 1 metric ton or more per year, unless they are explicitly exempted from the scope of registration. The authorization step is required for "substances of very high concern," and restrictions will be placed on substances when unacceptable risks to human health or the environment have been identified. The first step in the authorization process is placing substances of very high concern on a candidate list for further evaluation. After the evaluation, regulatory decisions are made about potential bans or restrictions on certain applications.

ing the development of European environmental legislation, through the provision and exchange of technical information.

In addition, the Chemical and Material Risk Management Directorate (CMRMD) of the Office of the Under Secretary of Defense, AT&L (Installations and Environment) identifies and analyzes chemicals and materials with changing regulatory profiles. Information on risks evaluated by CMRMD is reported to acquisition and environment, safety, and occupational health (ESOH) professionals on the Acquisition Community Connection (https://acc.dau.mil/CommunityBrowser.aspx) and DENIX/CMRMD (https://www.denix.osd.mil/portal/page/portal/CMRMD) websites.

Another resource soon to be available via DAU is a course titled "Strategic Material Selection," which will provide information on useful chemical ranking tools for acquisition professionals to select component materials. This course will help support making strategic acquisition decisions that address the life cycle issues.

Conclusion

Evolving chemical regulations can affect DoD weapon system acquisition and sustainment processes through subtle, or sometimes significant, changes to cost, performance, and scheduling criteria. Still, DoD and other organizations can capitalize on the opportunities presented by regulations such as REACH to green the military supply chain and acquisition process by developing high-performing substitutes and implementing improved chemical management processes.

The availability of chemical information not required under U.S. law, but required by REACH, will influence acquisition mangers' decisions about ESOH risks and life cycle costs associated with a chemical's use in a weapons system. The rewards of better informed decisions for chemical selection and usage will serve the DoD mission today and tomorrow. Using a life cycle approach, in combination with anticipating regulatory developments at the international, national, and state levels, will inform chemical usage decisions made by the DoD today, and promote readiness tomorrow. Enterprise-wide management of the selection, acquisition, distribution, use, and disposal of chemicals would better prepare DoD for future regulatory initiatives.

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Capability Disillusionment

Michael F. Cochrane, Ph.D.

At the turn of this century, Secretary of Defense Donald Rumsfeld identified a problem with DoD's system of developing and delivering joint warfighting capabilities: There wasn't one. The Services were generating requirements for weapon systems and programs they wanted, but the combatant commanders (who, under federal law, are actually authorized to command multiple Service forces in military operations) had no voice. The

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SOLUTION AGNOSTICISM
CAPABILITIES PORTFOLIO
DoDAF
JOINT MISSION THREADS
CAPABILITIES BASED ANALYSIS
JCIDS
GAP ANALYSIS

system that emerged to correct this deficiency was called the Joint Capabilities Integration and Development System (JCIDS).

As DoD policy, JCIDS has certainly helped to correctly align the requirements-generation process with the way the military actually fights as a joint force. But JCIDS is more than policy; it is also an analytical process. The inventors of JCIDS, in effect, asserted a theory of requirements development and acquisition that has come to be known generally as capabilities-based analysis.

The problem is that capabilities-based reality has never quite lived up to capabilities-based theory.

An assumption of the capability-based approach is that one should be "agnostic" with respect to specific solutions—the theory being that this frees the analysis from potential bias toward particular commercial or developmental solutions. The idea is to evaluate the military problem from a functional standpoint. First, you have to articulate what success looks like for the military task set in question. Then you have to figure out what capabilities are needed to accomplish the military task. Finally, you compare your existing capabilities against the functional standard to see if there is a match. If the capability is less, you have a "capability gap." If it is greater, you have an "overmatch."

This gap-analysis approach is the beginning of the JCIDS process. Gap analysis only examines the need for a capability. One must then conduct a capabilities-based solution analysis—again, scrupulously attempting to be agnostic with respect to potential solutions, to avoid pre-selecting a specific capability.

But a problem with this approach emerges even before you can say "capabilities-based analysis." The notion of military capability is difficult to translate from theory to practice. Such a term briefs well, but it is very difficult for military commanders to consider, for example, "force employment—ground" as some kind of generic, kinetic capability. What they want are the things they know: tank battalions, combined-arms task forces, long-range-reconnaissance-patrols, etc. (Having said this, let me be clear that I am not critical of the use of the word "capability" as a term to describe a range of related warfighting tools or assets—just the notion that one can analyze capability in the generic sense in any rigorous way.)

Capabilities-based theory tells us that capability should be fungible—that is, one should be able to have some way of providing equivalent capability using either materiel or non-materiel means. The problem is that to date, no one has been able to adequately quantify a capability in terms of "units of capability," such that we can compare the relative effectiveness of, say, an infantry battalion to an aerial bombardment in terms of providing equivalent force-employment capability.

That is why so-called "gap analyses" are nothing more than highly subjective, qualitative statements that sound like, "The joint force commander lacks the capability to do _____." There is nothing rigorous or analytical about this, so why beat around the bush? If the joint force commander wants more "x," just ask for more "x"! Let's not pretend that we have to be "solution agnostic" if there is a known solution that works now or is in development.

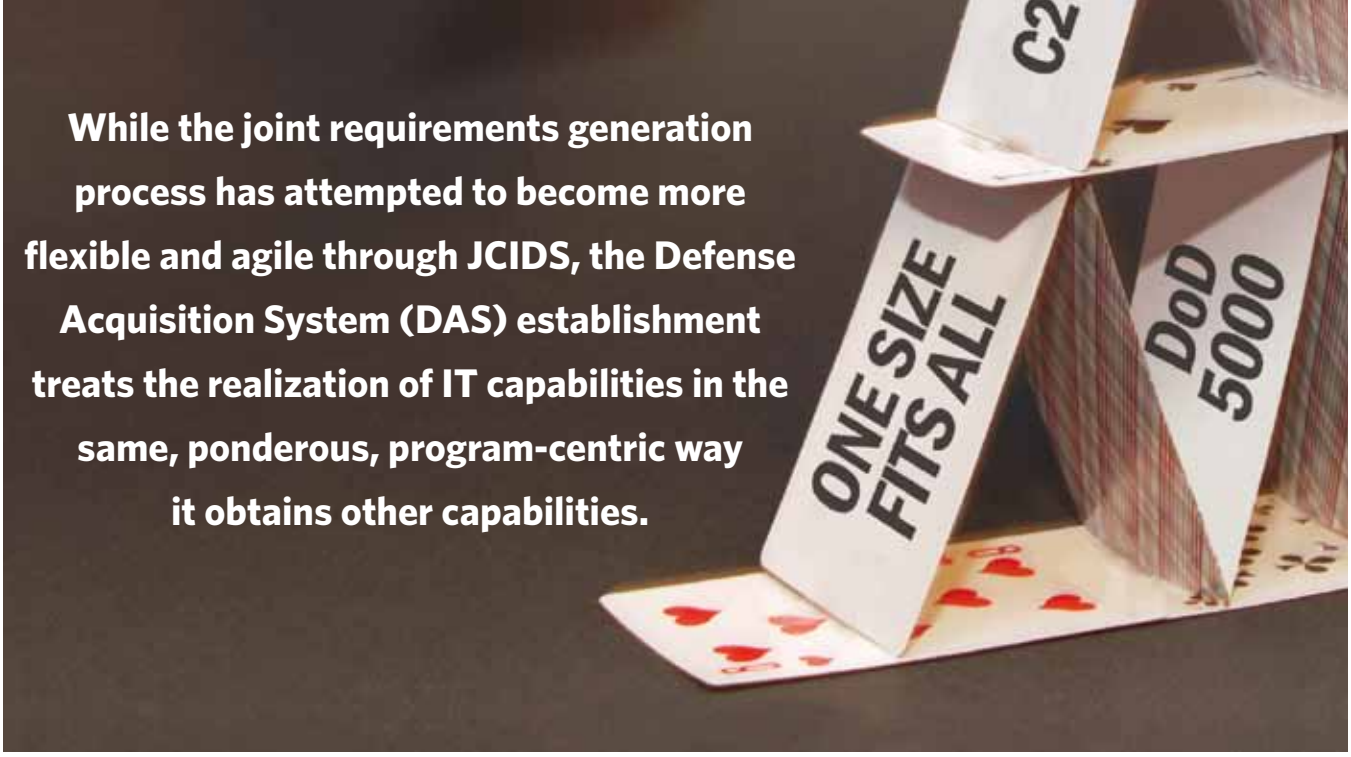
If the notion of kinetic (force employment) capabilities is problematic, the situation is even more confusing when discussing the relatively ambiguous notion of command and control (C2) capabilities. For the most part, these capabilities are associated with tools that assist the commander and his staff in the planning and execution of those plans through various communication networks and the maintenance of the continuous awareness of both friendly and enemy situations. The "things" providing these capabilities are usually software applications. Like anything else, the complete "capability" requires a trained operator and a physical infrastructure, but we have come to associate a "capability" with the "system" or computer program that provides it.

Unlike many other military capabilities, such as weapon systems or strategic lift assets, which are platform- and program-centric and follow a predictable operational life cycle, information technology (IT)-based capabilities, such as those in the C2 domain are based on technologies whose state of the art changes exponentially relative to time. Because there is no traditional engineering and manufacturing infrastructure required, IT-based tools can (or should) be rapidly developed, tested, and fielded. Unfortunately, while the joint requirements generation process has attempted to become more flexible and agile through JCIDS, the Defense Acquisition System (DAS) establishment treats the realization of IT capabilities in the same, ponderous, program-centric way it obtains other capabilities. This fact, combined with the failure of so-called "capabilities based" approaches to acquisition, suggests an alternative approach is needed; at least with respect to the C2 functional area.

We offer the following propositions to help summarize the current situation and begin to move toward the next generation of capability development and delivery (with particular reference to C2 capabilities):

- *The theory of capability delivery based on the notion of fungibility of capabilities and "solution agnosticism" is unsupported by either academic investigation or practical utility.*

  The definition of "capability" in the literature suggests that capabilities are combinations of both "ways and means." Ways refers to the non-materiel components of capability such as doctrine, organization, training; means refers to the materiel component.



While the joint requirements generation process has attempted to become more flexible and agile through JCIDS, the Defense Acquisition System (DAS) establishment treats the realization of IT capabilities in the same, ponderous, program-centric way it obtains other capabilities.

Attempts to translate the above concept of "capability" into a practical evaluative system to compare alternative capabilities have not been successful.

- *So-called "portfolios of capability" are an unrealistic and unworkable fiction and should be abandoned.*

Portfolio management, by definition, implies ownership of the portfolio elements. What is in one person's portfolio cannot also be in someone else's portfolio. An experiment in "capability portfolio management," which began in 2006, established "capability portfolios" in an attempt to adopt commercial industry best practices. However, in many cases, programs that are in one portfolio are also claimed by another. For example, Net-Centric Enterprise Services (NCES) is claimed by both the Net-Centric and the C2 portfolios.

Industry uses portfolio management to reduce risk and maximize return on investment. Since the unit of measure (money) is common to such portfolios, assessment of portfolio elements is a straightforward exercise. This is not the case with capability portfolios, in which one is trying to compare two or more capabilities absent any kind of capability metric.

- *Attempts to create analytical tools that purport to produce rigorous capability analyses supportive of "portfolio decisions" are an exercise in futility and should be discontinued.*

The previous two propositions lay out the case that, unless and until sufficient theoretical work is done to undergird the concept of capability based analysis, it is a waste of money and time to attempt to build capability-based analysis "tools."

Over the past several years, a great deal of time and money was spent developing three prototype tools that were advertised as being key to supporting C2 capability portfolio decisions. In one case, the tool was based on the DoD Architecture Framework (DoDAF), a labor-intensive process of displaying military concepts via operational and system "views." In another, the analytical centerpiece was a "mapping" of C2 systems to system functions; the goal being to create a "Rosetta Stone" to link military functions with tools. Lastly, an attempt was made to develop a complex visualization tool based on something called Joint Mission Threads (JMT). A JMT is a complex, detailed model designed to thoroughly describe a military mission from start to finish, to show how supporting C2 systems would be used to support such a mission.

A problem with all three of these tools is that their developers assumed that simply breaking up the military problem into more granular pieces would allow a clear alignment with functions that can be provided by C2 systems. However, simply discovering that a C2 system performs a function that supports a military task set provides no information about the degree to which that system performs the function—something that is key if one is going to make a portfolio decision (retaining one system and eliminating another).

A better approach would be to take the time and effort to build a value model that captures what is really important to DoD decision makers and stakeholders and apply such a model to the assessment of potential C2 solutions. This technique, referred to as value-focused thinking, or VFT, has been usefully applied in numerous portfolio-based decision problems throughout DoD.

- *Perhaps more important than so-called capability analysis is setting the conditions and structures for rapid and agile delivery of needed weapon systems and other capabilities. Some changes could include:*

  — **Reform of IT acquisition.** The acquisition of software-based capabilities must be freed from the traditional DoD 5000 series model. Such IT acquisition reform would include new approaches to funding the development and sustainment of software-based capabilities using such resourcing schemes as e-commerce and software as a service.

  — **Emphasis on net-centricity.** DoD policy must strengthen the requirement for common enterprise architectures based on software services and cloud computing and conformance to the Global Information Grid (GIG) 2.0 model.

  — **Centralization of standards, policies, and governance, and decentralization and diffusion of capability development in conformance with said standards.** Rapid and agile development and delivery of IT capabilities is more likely in such an environment than mired in traditional, large "software development houses" or materiel developers.

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

Years ago, I, too, became excited at the prospect of developing truly analytically rigorous capabilities-based approaches to meeting warfighter needs. The operations research community devoted whole symposia to the discussion of capabilities-based approaches. But the holy grail of a complete theory of capabilities-based analytics was never attained. We may yet achieve a level of capability analysis that yields to a quantitatively rigorous approach that will withstand the scrutiny of gatekeeper organizations like the office of Cost Assessment and Program Evaluation at the Pentagon (OSD [CAPE]). But in the meantime, we should apply our collective intellectual potential toward the more pressing, practical need to create a robust and flexible capability delivery system.

Getting the parameters of this capability development system right is more important than maintaining capabilities-based ideological purity. This means admitting that the complex details of military tasks and functions and the systems that support them might be best viewed as a sort of "black box." The important things to know are the inputs, outputs, and design parameters for the processes inside the box. If we get these parameters right (the "knobs" or "dials" on our black box) then we will have designed a robust capability development system in which the complex relationships of task and function to system will likely self-organize optimally without our interference.

It will take vision and leadership at the highest levels within DoD to move us to this kind of model, but it can be done.

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Shaping the Way Ahead

Army Biometrics WIPT Kickoff

Nicole Daniel ■ Kevin Trissell ■ Richard Hansen

A Terrorist Threat Approaches

Somewhere on the border of Iraq, a driver is stopped and asked to exit his vehicle. He is asked to enter the nearby building to have his passport and identity papers examined. Meanwhile, soldiers check his vehicle for contraband. Everything seems to be in order. The Iraqi passport appears to be valid and belongs to the driver. Before the man leaves, a U.S. official captures images of his fingerprints. Suddenly, the official's computer screen flashes that the man is wanted for questioning. The official confers with the Iraqis, and the driver is told he will have to wait. In a few minutes, U.S. and Iraqi police arrive and take the man away for interrogation.

How was this person identified when his identity papers seemed to be in order? Nothing unusual was observed in his vehicle. There was no notice to detain a man with this name. Yet he was a highly sought-after terrorist. Upon

Daniel *is the communications manager for the project manager at DoD Biometrics. She was previously a communications and public relations consultant for the federal contracting community.* **Trissell**, *a retired U.S. Air Force lieutenant colonel, has served as a senior strategy consultant to the program manager for DoD Biometrics since 2007. He has helped craft the strategies to guide the biometric successful efforts in Iraq and Afghanistan into programs of record to preserve biometrics as enduring capabilities for tomorrow's Army.* **Hansen** *is a professor of program management and executive coach with the Defense Systems Management College at DAU. He spent 26 years in the Army, in both the warfighting and acquisition fields.*

a more careful examination, it was later discovered that his passport had been expertly altered to conceal his actual name. Yet he was still caught, because he could not change his fingerprints. By employing biometric markers (fingerprints, iris images, etc.), the U.S. military is stripping the veil of anonymity from terrorists worldwide, making it increasingly harder for them to pass unnoticed.

Integrated Product Team Workshop

In August 2010, the Army Project Office for Department of Defense Biometrics held a conference with more than 140 attendees, to ensure that the deployed Service members and those in the next war have the biometrics capabilities that have proven so successful in Iraq and Afghanistan. This conference marks a milestone in the process to transition the initial biometrics quick reaction capabilities to an enduring program of record and ensure the optimal biometric capabilities are developed and fielded to soldiers, sailors, airmen, and Marines.

The Quick Reaction Capability and its Proliferation

In 1999, at Fort Huachuca, Ariz., the Army began to develop tactical tools intelligence gathering by soldiers. One such tool was the Biometrics Automated Toolset (BAT), field tested in Kosovo and then sent to Iraq with a Marine Corps unit in 2003. The BAT captures fingerprints, iris patterns, and facial images and compares them to an internal watch list. The Marines lauded the BAT and passed it to the Army unit replacing them. Use of the BAT in Iraq grew rapidly. To date, several thousand have been sent to Iraq and Afghanistan, where BAT is just one of numerous biometrics collection devices.

Meanwhile, the success of the FBI's Automated Fingerprint Identification System led DoD in 2004 to build a nearly identical system, the Automated Biometrics Identification System (ABIS). The original ABIS was to be DoD's central data repository, with a copy of every fingerprint from foreign nationals or known or suspected terrorists collected by Service members. This system was replaced in 2009 with the next-generation ABIS, which matches facial images and iris images, in addition to fingerprints.

The proliferation of biometric collection throughout the battlefield demonstrated the value of biometrics. However, the uncoordinated activities of the Services also limited their effectiveness. This led the four-star commander of all U.S. forces in Southwest Asia to state in August 2005, "DoD and individual Service elements are fielding individual systems with varying degrees of interoperability and adherence to standards… ." The commander urgently asked the Pentagon to provide "a comprehensive, requirements based, multimodal, multi-functional and multi-domain biometrics collection, storage, and matching system." This set into motion a series of events that led to the Fort Belvoir conference.

Several activities were initiated to quickly address the easy issues; however, the optimal solution called for by the commander would not be easy or quick. The optimal solution would require a series of analyses to determine the exact needs of the department, capturing these needs in a capability development document (CDD) and then starting an acquisition program to develop a system to deliver these capabilities.

The Transition to a Program of Record

The publishing of a DoD Biometrics Capstone Concept of Operations in 2006 kicked things off. This was followed by

Use of the BAT in Iraq grew rapidly. Several thousand have been sent to Iraq and Afghanistan, where BAT is just one of numerous biometrics collection devices.

a capabilities-based assessment, which culminated with an Initial Capabilities Document (ICD), approved in 2008 by the vice-chairman of the Joint Chiefs of Staff. The ICD documented 21 gaps in the department's ability to provide biometrically enabled identity management services. In 2009 the under secretary of defense for AT&L gave his approval for the Army to conduct an analysis of alternatives (AoA) to examine the best ways to fill the gaps identified in the ICD. In July 2010 the results of the AoA were reviewed and an alternative selected.

The Army's Training and Doctrine Command (TRADOC) is capturing lessons from operations in Iraq and Afghanistan as well as results and decisions from the CBA and AoA and in two CDDs. These two CDDs will guide the Army's two major biometric information technology programs, to develop, produce, and field both the biometrics collection devices and the department's central biometrics data repository.

While TRADOC is completing the CDDs, the Army Acquisition Corps is preparing to begin development of the objective system described in the CDDs in 2012. A successful acquisition program will require a lot of preparation.

Col. Ted Jennings, the project manager for DoD Biometrics, is charged with executing the two new programs. He will need the help of the wider DoD biometrics community to be successful. This help will come largely through participation in working-level integrated product teams (WIPTs).

Enduring "Rules of the Road" for Integrated Product Teams

In July 1999, the under secretary of defense for AT&L reaffirmed the department's commitment to the integrated product and process development (IPPD) concept of using integrated product teams (IPTs) throughout the acquisition process. Those IPPD and IPT concepts are described in "Rules of the Road: A Guide for Leading Successful Integrated Product Teams." This guide is designed to assist the program manager and supporting acquisition community in developing and executing high-performance IPTs. The purpose of IPTs is to facilitate decision making by making recommendations based on timely input from the entire team. The IPT approach simultaneously takes advantage of all members' expertise and produces an acceptable product the first time.

Initially, Jennings worked with his integrating IPT (IIPT) partner, Mark Godino, from the acquisition directorate of the Office of the Assistant Secretary of Defense for Networks and Information Integration, to develop a suitable WIPT structure to propose to the overarching IPT (OIPT). Consistent with the "Rules of the Road," once the structure was approved by the OIPT, the program manager selected his IPT leads and coordinated the IPT membership with the appropriate Services, OSD, and other government agency stakeholders, such as FBI and DHS. The WIPT membership gathered at the WIPT kickoff to understand DoD's biometrics leadership guidance for the program and receive some IPT training in order to begin to prepare the program documentation to support the Biometrics

Enabling Capability Full Deployment Decision (FDD) June 2011.

Conference attendees were divided into five WIPTs: cost, systems engineering, logistics, test and evaluation, and acquisition. The WIPTs, each led by an acquisition professional working for Jennings, discussed challenges the programs face and the how to work through the issues. Each WIPT will meet regularly to ensure the biometrics community is fully aware of the plans and progress of the project office's efforts to develop and field a fully interoperable enterprise biometric solution. While there is no one-size-fits-all WIPT approach, there are three basic tenets from the "Rules of the Road" to which any IPT approach should adhere:

- The PM is in charge of the program.
- IPTs are advisory bodies to the PM.
- Direct communication between the program office and all levels in the acquisition oversight and review process is expected as a means of exchanging information and building trust.

In addition, there are several important roles and responsibilities that apply to all WIPTs:

- Assistance to the PM in strategy development and program planning, as requested by the PM.
- Establishment of the IPT plan of action and milestones.
- Proposal of tailored documentation and milestone requirements.
- Review and provision of early input to documents.
- Coordination of WIPT activities with the OIPT members.
- Raising and resolution of issues in a timely manner.
- Assumption of responsibility to obtain principals' concurrence on issues, as well as with applicable documents or portions of documents.

Finally, the WIPT members began the "Rules of the Road" process of preparing IPT charters to identify the background, purpose, goals, membership, and governance of the IPT. The charter does not describe nor is it concerned with power consolidation or brokering; however, it is focused on "developing a strong framework and process to enable IPT members to achieve the PM's goals and objectives."

Now that the DoD biometrics IPTs are established, IPT members will meet as often as necessary to understand and build program strategies, to resolve issues, and, to produce a specified product—in this case, the necessary program documentation for a successful FDD.

As Army biometrics continues making strides in the current wars, the WIPTs have initiated their efforts to ensure an enduring program of record for the years ahead. "Our WIPTs are off to a great start and have established the disciplined processes and schedules to document our successful biometrics capabilities in preparation for the FDD, " said Jennings. "One of the most important roles is to personally help envision, write, review, fully understand, and communicate our program's acquisition strategy."

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Integrated Product Teams Best Practices Checklist

Open Discussions with No Secrets	
Do	**Don't**
☑ Engage all members in the IPT process by soliciting inputs and applying active listening skills.	⦸ Personalize organizational position.
☑ Know your team members' preferred methods of communication, and thoroughly understand their organizational roles and operating environments.	⦸ Isolate people. IPTs are only effective when all team members are participating.
☑ Trust and accept each person's expertise and advice.	⦸ Leave issues unaddressed. Unaddressed issues tend to resurface at higher levels and often drive major rework.
☑ State the extent of your authority/empowerment and immediately identify issues which are beyond established limits.	⦸ Forget to document actions/decisions. Documentation provides all team members an opportunity clarify issues and a historical record of decisions.
☑ Establish and stick to the agenda for the meeting. Establish operating procedures which allow any team member to redirect side issues to other forums.	
☑ Take the necessary time to prepare for the meeting in advance. Conduct research, and pre-meeting coordination necessary to optimize the time used in a group session.	
☑ State your organization's agenda and position. Openly discuss, resolve, and when required elevate issues.	

Empowered, Qualified Team Members	
Principals Must	**Don't**
☑ Ensure the IPT member is well versed in the mission and organization of the functional areas represented.	⦸ Conduct a briefing cycle separate from the overall IPT process.
☑ Provide guidance, direction and extent of authority to the members.	⦸ Principals should not overturn decisions made by empowered team members when those team members acted within their delegated authority.
☑ Provide professional education and training on a regular basis to ensure the individuals are qualified members.	
IPT members must:	
☑ Be trained in the operation of effective IPTs.	
☑ Communicate on a regular basis with their principal.	
☑ Inform the IPT of any limitations on their authority (empowerment) or on their ability to support the team's effort.	

Dedicated/Committed Proactive Participation	
Do	**Don't**
☑ Commit yourself to the objectives of the IPT.	⦸ Bring a personal agenda/negative attitude to the IPT.
☑ Represent your functional area without bias.	⦸ Bring additional support staff.
☑ Actively seek and receive input of others.	⦸ Skip meetings.
☑ Come prepared.	

Integrated Product Teams Best Practices Checklist

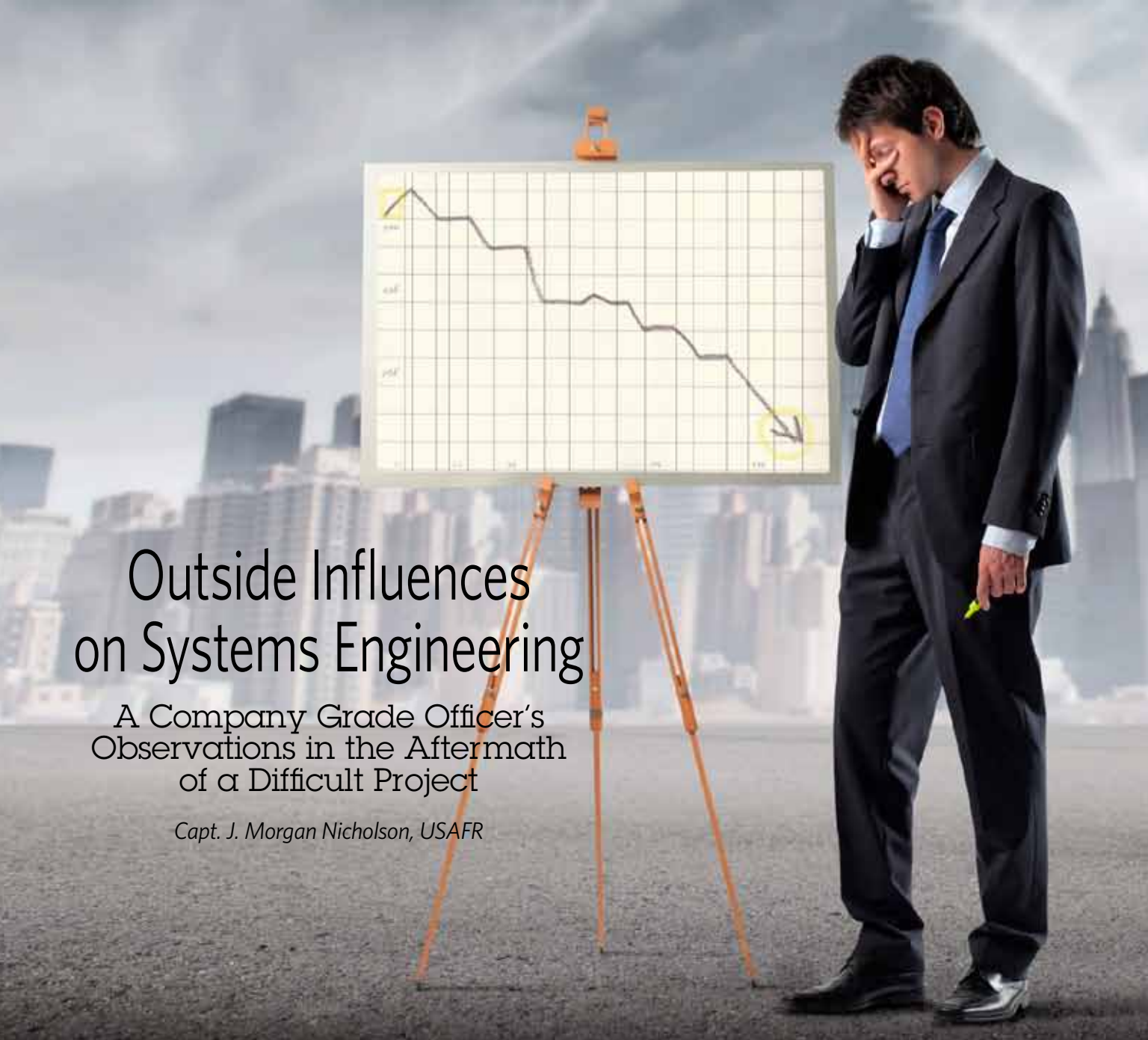
Issues Raised and Resolved Early	
Do	**Don't**
☑ Ensure that a structure is in place to identify issues (e.g., dedicate a portion of each meeting to raising/discussing issues).	⦸ Raise issues outside the IPT process (i.e., no end runs).
☑ Attempt to resolve issues within the IPT. When issues cannot be resolved, provide a complete description of the pros and cons of unresolved issues to decision makers.	
☑ Quickly elevate unresolved issues that are impeding program progress.	
☑ Ensure necessary functional responsibilities are represented.	

Charter, Launch, Initiation

Charter		*Launch*	
Do	**Don't**	**Do**	**Don't**
☑ Obtain senior management agreement on charter objectives.	⦸ Proceed without a written charter or establishing resources.	☑ Launch the IPT as soon as possible following charter sign-off.	⦸ Allow the launch to be cumbersome and unfocused.
☑ Ensure adequate resources are available (money, time, and people).	⦸ Make the charter too complicated.	☑ Ensure IPT agreement and understanding of the charter.	⦸ Discourage open member participation.
☑ Ensure charter goals, objectives, and schedules are realistic.		☑ Ensure IPT members are trained prior to launch.	

Goal Alignment

Do	**Don't**
☑ Develop approach(s) to provide feedback to team members and their home organizations	⦸ Ignore subpar performance
☑ Communicate this approach to the team and consistently apply	
☑ Recognize contributions of team members	



Outside Influences on Systems Engineering

A Company Grade Officer's Observations in the Aftermath of a Difficult Project

Capt. J. Morgan Nicholson, USAFR

In the world of acquisitions management, the systems engineering discipline is often thought of as a *separable, independent* activity that follows a certain flow chart and, if executed correctly, produces a useable item that meets the technical requirements within cost and schedule constraints. This fallacy has no doubt led to many project failures, including the case study presented here. To make matters worse, decisions made in areas thought to be outside of systems engineering are often the root cause of a project's failure. These non-technical decisions have a direct effect on the project's technical performance.

The relationship between engineering and management decisions was once well known, and bridging this gap is one of the reasons that the systems engineering profession came into existence. Unfortunately, this relationship is all too often overlooked, and systems engineering is thought to occur in isolation from management, contracting, logistics, and operations. This attitude

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can cause many headaches for a project team—and can lead to a project's demise.

A recent project I was part of experienced a series of systems engineering failures, causing the project budget to run over by roughly 300 percent and causing the delivery to take twice as long as anticipated. I inherited this project as lead systems engineer well after the original completion date and well after the system was designed.

Part of my job as lead systems engineer was to determine the causes of the systems engineering failures so they could be prevented in future projects. However, my findings attributed much of the hardship to failures outside the so-called systems engineering process. These failures may have manifested themselves as systems engineering issues, but I believe they were the result of decisions made very early in the project—in some cases, before the project even began. These business decisions rippled through the project unnoticed until project delivery, where they reared their ugly heads and the project spiraled out of control.

Two such decisions had the most severe consequences on the project's outcome. Both were made prior to the project's existence and manifested themselves as systems engineering failures at the end of the project. These insidious failures hid themselves throughout the project and could not be spotted using earned-value management (EVM) techniques or the most elaborate performance metric scheme. Decisions made this early can influence the design of the EVM and performance metrics, making them unable to reveal problems. Worse, these decisions can give the project team false sense of comfort about how the project is progressing.

The project was part of the portfolio of a much larger program providing sustainment and modernization to a number of Air Force weapon systems that are unique but interrelated. This project was a major communication system upgrade to a one-of-a-kind system. The entire portfolio was managed by a single Air Force organization and executed via a long-term, sole-sourced contract. A single contractor was used to execute a number of projects simultaneously across a number of different weapon systems under the umbrella of this single, overarching contract. The contractor was organized into separate product lines, each responsible for the projects associated with a single weapon system. The communication upgrade project was one of the largest (in terms of dollars) and most complex projects attempted on this contract at the time, and therefore drew significant attention from our leadership.

The Contract Structure

The contract type used for this project was a cost-plus-award-fee contract. This means that the government paid all project costs incurred by the contractor and paid the contractor's profit based on an award-fee plan. In essence, the government assumed all the risk; if the contractor did not deliver, the government gave it more money to complete the project. All the contractor risked was the award fee. This is different from a firm-fixed-price contract, in which the contractor is required to finish the project without additional cost to the government in the case of an overrun.

A cost-plus contract may indeed be the appropriate contracting strategy for this effort. With this strategy, the award-fee plan is the critical document the government uses to tell the contractor what the award fee (profit) will be based on. In other words, the award fee plan is how the government tells the contractor what is important and what is not. Furthermore, the government can quantify how much more important one deliverable is than another.

This is one area where the government failed on this project. The government did not effectively tell the contractor what it wanted; the government did not communicate that *delivering* the *right* product, *on time* and *on budget* was most important. Instead, the government tried to develop an award-fee plan that distributed profit evenly to the contractor throughout the fiscal year. Although this is good for the contractor, the project kick-off and planning phases had more profit associated with them than developmental test and evaluation (DT&E). As the customer, what would be more important to you—the method and timing that the contractor used to plan the project in the beginning? Or the successful integration, test and formal delivery of the product at the end?

Perhaps the most critical failure was a decision made before the project was even a formal project. The contractor was repeatedly blamed for the 300 percent cost overrun and 200 percent schedule delay. The contractor should still have received the majority of profit for successful project planning, requirements review, design review, documentation delivery, EVM reporting, etc. But the contractor attempted to cover the cost overruns by forfeiting its award fee and using the money to cover these costs—a calculated business decision that made sense in protecting the other projects in its portfolio.

How does this affect systems engineering? If the government tells the contractor that tasks such as EVM reporting are of equal importance to systems integration, the contractor will create, tailor, and follow processes that maximize its profit. The end result is an equal emphasis on EVM reporting and systems integration.

This problem was never noticed during the project. In fact, the majority of the projects on this contract are structured the exact same way. Since the overarching contract is structured this way, the award-fee reporting and EVM systems are also based on this design. Thus a project can appear to be chugging right along with great interim award-fee scores and impeccable EVM numbers—but secretly be heading for a train wreck.

The surprising failure for this project occurred during DT&E, when we found the software wasn't stable. In fact, the software crashed after 40 seconds of being "live" on the system.

This colossal failure was attributed to an incompetent engineering team, and in its aftermath, the project manager and entire engineering team were replaced. However, the award-fee score to this point (including the DT&E failure) was greater than 90 percent, and the EVM metrics were still within acceptable thresholds.

How can this problem be fixed? The contracting personnel who develop the award-fee plan should consider systems engineering in their planning. The award-fee emphasis should reflect what is most important to the government—successful project delivery. If 90 percent of the award fee (rather than 5 percent) had been based on DT&E, I suspect the contractor would design processes to help ensure successful DT&E completion. After all, does it really matter when the contractor holds kick-off meetings or when design reviews take place if the project is delivered on time nd within budget?

Test should always be an independent entity and should have a separate chain of command.

The 'Org Chart'

The paradigm used by the contractor to organize itself also creates challenges for systems engineering. The contractor for this project primarily uses a projectized organizational structure, which offers a number of advantages: strong communication channels, very rapid response time, loyalty to the project, and ability to maintain key expertise.

In theory, a projectized organizational structure makes sense for a product line that consists of a single, one-of-a-kind system. However, expertise becomes very "stovepiped" and is not shared in the organization.

I once worked on a project that involved designing a programmable logic controller (PLC) to manage the cooling air for an electro-optical system. Having spent several years as a control-system technician, I was shocked to find that nobody who engineered the system had any control-system expertise; this is a highly specialized field, and these tasks are typically accomplished by highly specialized personnel.

Not surprisingly, this project had a number of problems in quality audits, testing, and integration. The organization employed a number of engineers with control-system expertise, but they were allocated to a different project on a different product line, so these resources were not shared.

The communication-upgrade project had a similar problem. The project involved not only communications engineering (a highly specialized field) but also a highly irregular, specialized type of communication protocol. The project team did not have any communication experts. Furthermore, they did not employ anyone with knowledge of this protocol, intending instead to "build expertise inside the product line." They did this despite having communications engineers in the organization from other product lines and despite the government's request for them to leverage this expertise.

Note that I said the contractor *primarily* uses a projectized organizational structure. Some personnel are occasionally matrixed to the product line for functions such as systems engineering, logistics, drafting, and configuration management.

Did you notice that "test" was not in the list? This is because the so-called "independent test team" reports directly to the product line manager. This is a fundamental flaw in this organization structure. Test should always be an independent entity and should have a separate chain of command. For example, the Air Force Operational Test and Evaluation Center (AFOTEC) reports directly to the Headquarters Air Force rather than a major Air Force command, such as Space Command or Materiel Command. This ensures the requirements are being independently verified and helps reduce the influence of cost and schedule pressures.

For this project, lack of test independence was often a problem. The contractor's product line manager often agreed to ridiculous test deadlines and objectives despite the objections of his test lead. On one occasion, the test lead actually had to leave the meeting because she was so upset with the product line manager. Moreover, the test lead was actually "shushed" in a technical meeting when she tried to report that a particular requirement was not being met.

This lack of test independence led the project down a number of paths that were to its detriment. Many times, the software was thought to be ready for release only to find critical defects during government acceptance testing. These defects caused serious cost and schedule impacts that could have been avoided—not to mention the failures in customer-expectation management.

The contractor also had a separate functional division inappropriately named "systems engineering." This division typically contained the "best and brightest" engineers in the organization, with a comprehensive understanding of the systems in the portfolio. These engineers were often "promoted" from the product lines to the systems engineering division and focused primarily on advanced concepts and big-picture kinds of issues.

The project had a number of critical defects that tied directly to incorrect requirements. The project ran over by roughly 300 percent, and three-quarters of the overrun costs were devoted

to fixing defects—many of which could be traced *directly* to an incorrect requirement. Most of these incorrect requirements could have been prevented by including more system experts in requirement development. These system experts were not available to the project team because they were part of the systems engineering division and because of the project-based nature of the organization. The flaw was not in the engineering process itself but in its execution, due to a lack of expertise.

The organizational structure used for the project set the stage for a number of problems to manifest themselves during integration and testing—particularly a lack of system expertise and independent test activities. Once again, the failures appeared on the surface as engineering failures, such as poor programming and poor unit testing. However, poor programming and poor testing were a result of poor systems engineering and a lack of test team independence—both of which originated with the org chart.

Conclusion

Many systems engineering problems in the real world are more than just process gaps in systems engineering; they are often symptoms of business decisions that *manifest* themselves in systems engineering. A poor organizational structure creates a lack of systems engineering expertise, which leads to poor requirements specifications. This is manifested as a series of critical defects during formal DT&E. A poor contracting strategy sets the stage for a systems engineering strategy that focuses on following the process rather than delivering a successful product, on time and within budget.

You might be thinking, "Well, this is obvious." But it is rarely addressed in any systems engineering textbook or graduate course. Systems engineering is treated as an independent, objective entity that directs the development effort, with the end user fully considered and acting as an advocate of the customer and a check-and-balance between the business and technical aspects of the project.

In reality, these functions are so closely coupled that they should not be thought of as independent at all. Management questions such as "How do we organize ourselves to minimize overhead?" should not be answered without considering the impact on the end product. Moving all the systems experts out of the divisions that work on the systems doesn't make sense from a technical perspective. However, from a business perspective, it minimizes overhead and makes a nice-looking org chart.

It is often stated that systems engineering processes should be applied throughout the project life cycle. This is true. But what about prior to the project? Does "cradle to grave" really encompass everything? Can a project be doomed before the need is even conceived? Perhaps it can, and systems engineering should be a serious topic of discussion when the organization is formed or when the contracting strategy is outlined.

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EIGHT BATTLE-TESTED SURVIVAL TACTICS

for the New, Entry-Level DoD Program Manager

Brian E. Schultz

"It takes about 10 years to [develop] a good fighter pilot, and the same is true for a good acquisition professional."

—Gen. Lawrence Skantze, former commander of Air Force Systems Command, USAF (retired)

Helping our new and junior program managers (PMs) learn their profession is not an easy task. One tool that helped this author was the advice and stories from senior PM mentors. Their insights assisted me in the current day-to-day challenges and also helped me realize that a PM career can be a very rewarding and fulfilling endeavor.

Although the following is a hypothetical mentoring session for a new PM, it is based on my actual experiences. My objective is to generate greater interest in mentoring and sharing appropriate stories for those new to the PM career field. The focus of this article is on PM soft skills such as leadership, teamwork, and communication. Please note the position title of "Integrated Product Team (IPT) lead" is used interchangeably with junior PM in this article.

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So you're our new PM? Let's discuss some PM survival tactics that I've learned during the course of my career.

1 Keep your promises!

"He loses his thanks who promises and delays."
—Proverb

Years ago, I worked on a major communications program. The program had a long history of schedule slips because of technical problems discovered during developmental testing. The contractor would propose new dates that our PM accepted without fully understanding the risks. We were making good progress but continued to slip major milestone dates due to overly optimistic schedules. It got to the point where the new program executive officer (PEO) told our program office that we had a credibility problem, and we were going to fix it.

Our program office PM did not last long, and our new one eventually turned things around by making sure we delivered what and when we promised. Any proposed schedule was scrubbed in great detail. The new PM did not sign up to the new schedule until we had key risks and appropriate mitigation strategies in place. We established stretch goals to challenge and reward the team for early completion dates. The contractor also brought in a new PM, and everyone understood that we were serious about meeting promised contractual milestones and schedule dates. We eventually regained our credibility by meeting interim milestones and delivering the system in accordance with the new schedule. It wasn't easy, and it took a lot of hard work and diligence.

As a junior PM or IPT lead, you have an important role. The system PM is counting on you to meet your commitments in support of the larger program or portfolio of programs. If you are asked to support a milestone or provide a deliverable by a certain date, make sure you meet it. If you can't, don't wait until the last minute to spring the bad news. Seek help by elevating issues that can't be resolved at your level. Asking for help when you hit a roadblock is not a sign of weakness, but be sure you have done everything at your level to resolve the issue before elevating it.

PMs are responsible for meeting their program commitments. Be careful about what you sign up to; but once you have, make it happen!

2 Know your customer and your product.

"There is only one boss. The customer. And he can fire everybody in the company from the chairman on down, simply by spending his money somewhere else."
—Sam Walton

Acquisition managers typically think of the customer as the warfighter or the user of the system. While PMs should clearly understand the warfighter requirements and be technically smart on their system and its technology, there are other customers to consider.

If you are asked to support a milestone or provide a deliverable by a certain date, make sure you meet it. If you can't, don't wait until the last minute to spring the bad news.

I'll never forget an orientation briefing I attended with a PEO and a senior PM I worked for. Part of the discussion was about the customer and went something like this:

PEO: So who is your customer?
PM: Air Combat Command.
PEO: What do you provide them?
PM: We provide them with the system, training, and logistics support.
PEO: I thought the company develops the system. The program office does not bend metal or lay cable. What do you actually provide them?
PM: Well, we provide the overall program management and have responsibility for the system before it's accepted by the user. We develop the Request for Proposal (RFP) and the contract documents.
PEO: OK, so your product is this document, and your customer for that document is the company or companies that respond to it?
PM: Yes, sir.
PEO: Excellent.

We need to understand the significance of this customer relationship. Yes, the user is the ultimate customer of the system but your day-to-day customer is actually the contractor and other acquisition stakeholders. We need to pay close attention to what we produce and in your case, its acquisition strategies,

RFPs and contracts. If you don't develop and execute these products effectively, do you expect to have good outcomes?

PMs need to focus on the key products they produce which lay the foundation for their program. These products are acquisition strategies and plans, program baselines, and contractual documents. PMs also need to know the customer of these products.

3 Stay focused on program priorities.

"Focus on remedies, not faults."
—Jack Nicklaus

PMs must carefully choose what they and their team will focus on. It is not unusual for a PM to tell their team that some of the tasks at hand will have to wait for another day while they address priority issues. This sounds easy, but it's not always the case, as the following story suggests.

A junior PM in my organization encountered an issue with a contractor who was having some export issues on a small but very important fixed-price commercial contract for a foreign military sales customer. The contractor was uncooperative in sharing information on its get-well plans and suggested that the U.S. government may need to provide some cost and schedule "relief" in a contract modification. Our PM was focused on other, lower-priority issues in his portfolio of programs. He told me there was nothing we could do other than wait and see what would happen, since our contracting officer did not support a contract change. I did not accept this wait-and-see approach and suggested we reassess the resolution plan.

After some brainstorming with our contracts and legal staffs, we advised the contractor that we had decided to initiate a contractor performance assessment report (CPAR) on this contract. This was unusual, since a CPAR was only optional, because of the small contract value and the contract was well underway.

CPARs get contractor attention since the report goes into a database used to assess contractor past performance in competitive source selections. To be fair, this particular CPAR only covered the period of the contract left to be performed; but this period would include the delivery and test of the system. It did not take long before we saw a different approach from this company. Our previous issue was resolved quickly and there was no impact to the schedule. The system was delivered on time and worked flawlessly. It was a great pleasure to inform this company that we submitted a great CPAR for their performance on this contract.

PMs have many tools available to address program risks, issues, and problems. You may have heard the saying "Hope is not a method." PMs are not hired to hope or to wait and see what happens. Their job is to take actions that will bring about successful outcomes.

4 Set a high standard.

"Whatever you are, be a good one."
—President Abraham Lincoln

Several years ago, I worked as an industry PM on a defense contract with a major subcontractor. Our prime-sub team insisted on high-quality work and we designed internal processes to enforce the standards. For one particular deliverable, we asked the subcontractor to prepare a detailed report that was due to the customer the next day. Even though it would be late, I asked for a revision of this report to clarify some critical items. The subcontractor PM took some pride in authorship and was concerned that the report was revised significantly. When confronted with the concern, I apologized for not providing feedback earlier that we were re-working the deliverable. I also stated that the report did not adequately address one of the key program issues. This issue was important enough to warrant a slip of a few days in the delivery. Later, the subcontractor PM thanked me for insisting on the rework as this deliverable proved to be crucial in rapidly resolving several program issues.

PMs have many demands in their daily schedule. There are many requests for information and regular reporting on program status, issues, etc. The temptation to be satisfied with something that is not high-quality will arise. It can be easy to rationalize that this product is "good enough."

Don't fall into this trap. If you are not given enough time to deliver a high-quality product, let your boss know that. You may get additional time or help and, if nothing else, you'll be managing expectations. Set the expectation with your team that only top-quality products will be accepted. I clearly remember the feedback I received from a Program Office Director when I had submitted a paper of poor quality. His comment was: "If you can't be trusted with this little task, how can I trust you with something big?"

5 Accept new challenges with the right mindset.

"When you've got something to prove, there's nothing greater than a challenge."
—Terry Bradshaw

A few years ago, our organization learned we would be inspected as part of a base-wide Unit Compliance Inspection (UCI). The UCI is conducted by an inspector general (IG) organization that assesses an organization's compliance with required mandates for managing acquisition programs. This inspection was a concern because several of us had not experienced one before, and we had doubts about how well we would do.

Our PM recognized that the team was not approaching the inspection properly. He changed our mindset by getting the team to recognize that the inspection was a great opportunity to showcase how good we were. It was also an opportunity to share some of our best practices in which we had invested a lot

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of time and effort. We knew we were doing all the right things, but we needed to gather the evidence to show the UCI team. The inspection came and the IG rated us as an outstanding team; one of only two in the entire acquisition wing!

Challenges are often great opportunities to learn and excel. PMs should expect and seek out new challenges. This includes seeking career broadening type jobs and taking on additional responsibility when offered the chance. It also means stepping up and getting the tough jobs completed, even when it might appear to be very difficult.

6 Build trust and communicate with your stakeholders.

"The glue that holds all relationships together—including the relationship between the leader and the led is trust, and trust is based on integrity."
—Brian Tracy

The lack of effective communication is often cited as one of the major issues in acquisition. Communications flow and mechanisms should be defined so the team and stakeholders understand what the expectations are. While good communication is important to keep the IPT on track, it is also one of the primary tools you can use to build trust. We have learned and re-learned that establishing good communication does not just happen, but takes planning, implementation, and follow-up.

Here's an example of how difficult it is when you don't have trust and good communications. A few years back, I inherited a really bad situation on a Foreign Military Sales (FMS) program for a Middle Eastern country. The FMS customer needed some important upgrades for their fleet but was reluctant to start the FMS process. We did not understand why. Despite repeated attempts to discuss this with them, we did not get a response.

After talking to several people familiar with the previous program, I learned that this customer believed my predecessors had insulted them and were insensitive to the host nation culture. Communications were one-sided (our team providing information) and detailed discussions were not conducted. When a technical anomaly was discovered in their software, the customer had no faith that the proposed fix would resolve the problem and even questioned its utility after successful testing. It then became clear as to why this FMS customer was reluctant to invest any additional money in this program: it was a lack of trust.

It took a lot of repair work but we re-established a good relationship. Our trip itineraries now included time to drink tea and talk with our counterparts before getting to work. We accepted offers to social events after work. We started educating team members about cross-cultural communications and sent staff to appropriate training before they traveled in-country. Finally, we took extra time to explain the program details and ensured that concerns were fully addressed. Trust was re-established and the country moved forward with the badly needed fleet upgrades.

Trust is a key aspect in building relationships. A senior industry manager once told me, "If we have the right relationship with our customer, we can accomplish anything!"

7 Develop and maintain teamwork.

"Coming together is a beginning. Keeping together is progress. Working together is success."
—Henry Ford

I remember when I was the supervisor of a junior PM who led a team that was developing an airborne command and control mission system upgrade. I received feedback from the PM and his industry counterpart that the program team was struggling. The engineers were debating technical issues and the team's progress was very slow. I attended one of their meetings as an observer and confirmed that we had a major problem. Two individuals could not agree on even minor issues and both were in technical leadership roles. It came to a head when a senior company official complained to our agency senior leadership, accusing my team of holding up progress on the program.

In an attempt to foster teamwork, we decided to conduct a Working Together Team (WTT) session. The purpose of the WTT was to build trust and foster a better working relationship with the players. The WTT was conducted over a 2-day period, and the team was brutally honest in speaking about their concerns. As a result, both parties gained a new appreciation for what the other was feeling. We developed and received buy-in

for a communications and issue resolution plan. In hindsight, this two-day team-building session was one of the turning points in getting the program back on track.

PMs must ensure that the team is working together as a cohesive unit and that everyone is accountable for their role in the program. Once the team is performing, continue to monitor the interactions and ensure that new players understand the expectations.

8 Develop your skills and get training/education.

"I think everyone should go to college and get a degree and then spend 6 months as a bartender and 6 months as a cabdriver. Then they would really be educated."
—Al McGuire

Acquisition, program management, and leadership training are essential for the new PM. A typical college education does not equip the new PM for this profession, and there is no entry-level resident technical school.

While the training courses are necessary, program management is learned by doing. Get involved in activities that you have not experienced before. Ask to sit in as a strap-hanger to observe a particular process or event and observe senior acquisition professionals in action.

When I was in my first junior PM job as a young 2nd lieutenant, I volunteered to brief a visiting senior leader on my program. Our office scheduled dry-runs and I worked very hard to prepare. When the time came for me to brief the leader, I thought I was ready. Unfortunately, the briefing was right after lunch, and the room was dark and very warm. I had practiced keeping good eye contact, but that did not help since the visiting official was sound asleep. My boss gave me the cue to keep going, which I did. The senior leader awoke in time to ask me a question and compliment me on a great briefing. I learned early on as a junior PM to expect the unexpected and to try to avoid certain events right after a big meal!

Your career development plan is crucial for your long-term growth. While you need to take care of mission accomplishment in your current job, think about your developmental goals and have a plan to get there.

Closing Thoughts

There are many lessons to be learned in acquisition program management. Many will be learned by trial and error as you gain experience. There is no simple checklist to address the complex issues you will face, but good judgment will be your friend. Fortunately, you will have many experts to assist you. Enjoy your PM journey, and don't forget to help others who follow you. Challenge your team to achieve great things, and then have fun getting after it!

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Improving Services Acquisition Tradecraft

Services Acquisition Is Not for Amateurs

Peter Czech ■ John Mueller

Most of our services are bought by people as an ancillary duty. They're, in a sense, amateurs. They're trying to get something else done, and they're issuing contracts for services in order to help them. That's not their principal preoccupation.

—Dr. Ashton B. Carter
Testimony before the Senate Committee on Armed Services
Sept. 28, 2010

In 2010, DoD spent $201 billion of its $367 billion contract budget on services ranging from facility maintenance to engineering evaluations. In his Sept. 14, 2010, memorandum on affordability, Carter cited the need to improve tradecraft in services acquisition. The recent attention to services acquisition has elevated this once ignored activity to a prominent role in DoD's future budget.

Sizing Up the Issue

The Department of Defense is one of the largest buyers of materials, goods, and services in the world. A majority of this effort is contracted out vice performed in house, including many types of services. In a trend that began in the early '90s, the amount of funds spent on services has grown at an accelerated rate as the U.S. military transformed itself a personnel/hardware based force to an information based force. In 2010, DoD purchased just over $200 billion in services from a total budget of more than $530 billion. If these purchases were concentrated as a single business unit, the "DoD services unit" would rank as the third largest U.S. business, between ExxonMobil and Chevron, respectively. This "nearly the largest business" is run by a collection of government employees stationed around the globe each trying to provide the warfighter with mission critical items. The challenge Carter issued to this distributed workforce is to increase our process efficiency so that funds can be reallocated to direct warfighter support and equipment modernization. His guidance is a call to action on improving business practices.

What Services Does DoD Buy?

The services DoD buys represent a wide range of deliverables. Some were previously performed by military members or civilians working for the government but now can be effectively purchased in the commercial market. Other services represent unique commercial capabilities adapted to the military's mission.

One of the first challenges facing the services acquisition professionals in optimizing their processes is consolidating service activities into like categories. To assist this effort, Shay Assad, director, Defense Procurement and Acquisition Policy (DPAP), provided a definitive framework for DoD services in his memorandum on the taxonomy for the acquisition of services, Nov. 23, 2010. This framework grouped 33 activities into six large groups, providing the needed clarity for improving how each of these categories is acquired (Figure 1).

Of the six groupings, three categories account for 74 percent of the total service acquisition budget. These three categories are Knowledge Based, Facility Related, and Equipment Related Services. Within these groups, growth is increasing in the areas of Research and Development (R&D), Professional Advisory and Assistance Services (A&AS), and Weapons System Maintenance. The remaining categories range from less than 1 to 10 percent of the total (Figure 2). In the spirit of "fishing where the fish are," we'll narrow our focus on these "Big 3" groups.

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Figure 1. The Services Taxonomy—2010

Knowledge Based
Engineering Management
Program Management
Logistics Management
Management Support
Administrative and Other Professional
Education and Training

Transportation
Transportation of Things
Transportation of People
Other Travel and Relocation

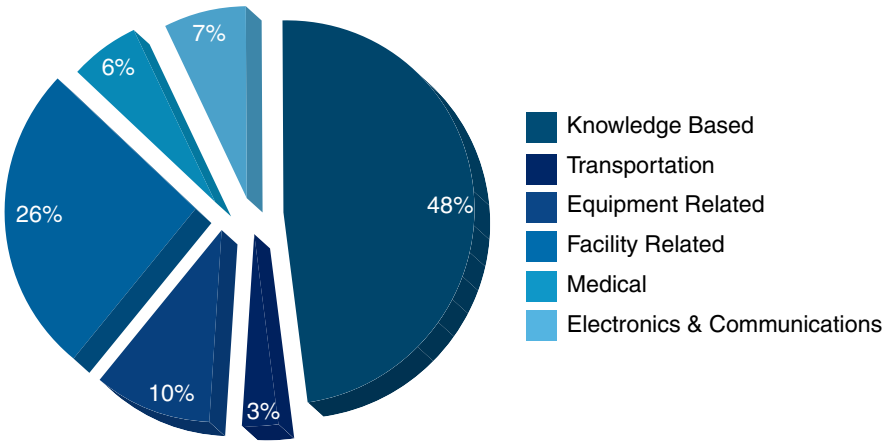
Equipment Related
Maintenance, Repair, and Overhaul
Equipment Modifications
Installation
Quality Control
Technical Representatives
Purchases and Leases
Salvage

Facility Related
Architect/Engineering
Operation of Government Owner Facilities
Machinery and Equipment Maintenance
Buildings and Plant Maintenance
Natural Resource Management
Utilities
Housekeeping and Social Services
Purchases and Leases
Railroad Equipment Modifications

Medical
General Medicine
Dentistry
Special Services

Electronics and Communications
ADP Services
Telecon
Equipment Maintenance
Equipment Lease

Figure 2. DoD's 2010 Services Expenditures



What Makes Services Acquisition Unique?

The primary characteristic of the "Big Three" is that they are knowledge-based services, for which qualification of the deliverable is harder than it is for a more traditional service. For example, if your objective is facility grounds maintenance, a functional element is having the lawn mowed. In seeking this service, it is fairly easy to establish a performance standard on the length, interval between mowing, and any bounding conditions. This performance standard makes it easy to estimate, bid, and perform a comparative analysis amongst the potential performers. Contrast that with requesting an engineering analysis on a proposed design change or providing consulting services on scientific research. While the output (report or recommendation) can be well described and specified, how well the performer completes that objective and the accompanying quality standard is significantly harder to specify than "Mow the lawn every Friday at a height of three inches."

A second unique characteristic of services procurement is that the buyer is frequently at an intellectual disadvantage in comparison to the seller. This is not an insult to the intellect of the DoD buyers, but a feature inherent to a knowledge-based product purchase. The challenge is how to negotiate a reasonable price from a disadvantaged knowledge position. This is especially true when inexperienced or infrequent members of the acquisition workforce seek to acquire knowledge-based support from companies steeped in the DoD business. While a similar condition can exist in traditional acquisitions, the physical nature of having something to see and touch can quickly educate a buyer vice the intangible nature of a knowledge-based product.

A third characteristic which challenges the services acquirer is a frequently underestimated barrier to real competition. On the surface, not having a major tangible delivery would translate into low barriers to entry for knowledge-based products; however, in reality it is difficult to obtain/retain the specialized talent, security clearances, and on-site presence often called for in service contracts. As a result, true competitions for these efforts are infrequent leading to an entrenchment of the incumbent provider. Taken to the extreme, this entrenchment leads to a transfer of the knowledge required for program continuity from the government team to the contractor support. This further suppresses the opportunity for real competition.

Four Strategies From the PEO

One best practice Carter identified was the Air Force's establishment of a program executive officer (PEO) for services, Maj. Gen. Wendy Masiello, USAF PEO for Combat and Mission Support (AFPEO/CM).

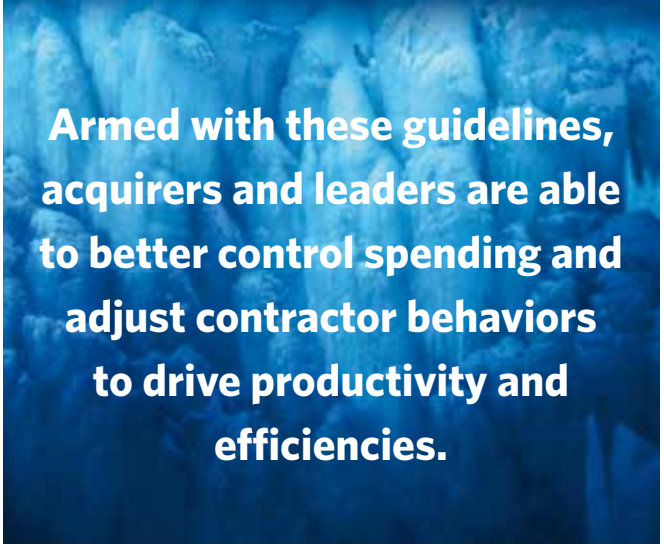
The Air Force recognized the growing importance of services acquisition and in 2007 established a PEO for services to provide an executive voice for the acquisition. In 2010, the Air Force spent approximately $64.9 billion on goods and services of which nearly 40 percent, or $25.7 billion, was spent on services (excluding research and development). According to Masiello, her first action was to provide a standardized acquisition approach for this diverse field.

> Developing an effective structure in concert with the right management and oversight tools is key to the efficient management of these often times mission critical programs. The AF personnel that lead service contracts must have access to the most effective methods to manage the mission critical workforce and functions provided through these acquisitions.

In response to this challenge, she has provided the following guidance to assist those in these critical positions:

- **Optimize your span of control.** While all echelons of leadership must be involved in requirements development, source selection, and performance assurance, the real execution and management of programs must be accomplished at the intermediate and local levels. The role of the senior services manager is to establish the governance construct and perform executive level oversight as required.
- **Position the mission owner as the leader.** Too often the mission owner does not fully understand or recognize their ability to shape and hold accountable contractors that provide mission critical capabilities. As a result, they grow accustomed to accepting a lower level of performance than what they are actually paying for. By actively encouraging delegation of acquisition oversight and decision authority, AFPEO/CM is reinforcing driving mission ownership to the functional commanders and mission owners. By connecting these leaders into the acquisition system, they are given the tools and insight required to affect the conduct of the contractor provided mission capability necessary to run their organizations.

- **Find your rhythm.** A reliable battle rhythm assists the flow of information, helps institutionalize oversight and processes, and creates recurring opportunities to make adjustments. As a result, the various echelons of the Air Force are connected in the conduct of services acquisitions more fully then they ever have been connected before.
- **Hold yourself (and others) accountable.** The use of program and services acquisition oversight reviews drives ownership and accountability of both specific programs with their associated contracts, and the overall management and execution of delegated acquisition authorities.



Now armed with these guidelines, acquirers and leaders are able to better control spending and adjust contractor behaviors to drive productivity and efficiencies. In the current fiscal environment, it is imperative to understand precisely what the service needs a contractor to provide, or accomplish, and to define that requirement as specifically possible.

How We Become Better Buyers

From the preceding paragraphs, the obvious answer to becoming a better buyer is improved knowledge and awareness. This can be gained in a number of ways frequently defined by how long it takes and how costly is the lesson. With the increasing desire for efficiency now, it's unlikely that "long" and "costly" are the right answers. To that end, we asked Masiello for her "best practice" examples for improving services acquisition.

Take a fresh look at your requirements. Requirements holder awareness and cost visibility are the keys to reducing excess knowledge-based services. Excess support is not an intended consequence, but develops incrementally in a services contract while the performer strives to make their service more valuable. Organizations must fully understand the intended scope and pricing arrangements associated with contractor support. Once there is full awareness of what organizations are buying, then efficient decisions can be made regarding requirements definition and used to determine the proper mix of contractor to organic capability.

Enhance competition and ensure that price matters. Historically, services are awarded on a "best value," full-tradeoff basis. This decision process frequently invites complacency on an incumbent's part and an expectation that the customer will be willing to pay more each year for the same level of service. By putting source selection emphasis back on price, the non-price-related advantages of being the incumbent are deemphasized, re-establishing price competition. Full competition encourages the incumbent to improve its pricing as well. Carter's direction to improve tradecraft in services acquisition included a 3-year period of performance limitation for single-award A&AS contracts. I am also applying the 3-year period of performance limit (including options) to task orders for A&AS awarded under a multiple award indefinite duration/indefinite quantity (ID/IQ) contracts. Additionally, for the most part, multiple award ID/IQs will be restricted to a 5-year ordering period. The only exceptions will be for longer term programs where improved performance or reduced costs can be truly realize and measured. By using these approaches acquisition teams will be better positioned to achieve a balance between continuity, ease of ordering, and effective competition.

Match the contract type to your knowledge level. There is not a standard contract type for all services acquisitions. Although DPAP is emphasizing greater use of firm fixed price (FFP) contracts, FFP is not a one-size-fits-all solution. The correct answer to question "What is the appropriate contract type?" is "It depends"—the same answer to every classic acquisition question. However, time-tested constructs provide a good guide:

- When the requirement is uncertain, share the risk in a cost plus fixed fee (CPFF) effort to lower price and attract offerors while gaining cost insight for a subsequent fixed price incentives (FPI) or firm fixed price (FFP) arrangement, if possible.
- With a well-defined and stable requirement, push the risk to the contactor via a FFP arrangement.
- When the requirement is between these extremes, consider using a mixture of contract types.

However, to find the most efficient contract methods and develop efficiency driving requirements documents, the government must understand how industry prices the elements of work and uses its labor force. For example: In the case of a well-defined requirement with quality historical cost and utilization data, it is generally wise to issue a FFP contract. However, after a few iterations of FFP contracts, visibility into material costs and labor utilization tends to deteriorate, along with an understanding of the effects of innovation, efficiencies, and the range of available industry approaches. This is especially true if the government has lost its technical expertise for the function. In these cases, a cost plus incentive fee (CPIF) or other cost incentive arrangement can keep the pressure on the contractor to provide efficient approaches and provide the government with a new baseline for costs. By reestablishing cost insights, we better position our acquisition teams to as-

sess proposals and negotiate follow-on FFP contracts.

For the services acquisition workforce, the bottom line is that requirements holders and their supporting acquisition professionals must understand how the formulation of the performance work scope, coupled with the stability and certainty of the requirement affects contractor pricing strategies. With this knowledge, the government can adjust the requirement and more cost effectively assign tasks between government and contractor performers. Empowered with this insight, the correct acquisition approach can be developed to effectively employ declining budgets.

The Greatest Opportunities for Savings

While the opportunity for savings in the services arena appears to be large, the pressing question is where to start. When we posed this question to AFPEO/CM, her response was:

> My focus is on equipment related services related to sustainment of weapons systems. It is our largest spend area. Consistent with our functional ownership approach, managers need to team with the requirements owners, so together, they can rethink sustainment approaches. An example of potential savings is the MQ-1 (Predator) organizational-level maintenance. The Air Force reduced the Predator buy by two units to purchase technical data. That tech data saved an estimated $100 million in projected O-level maintenance and had the added benefit of increasing Predator mission capable rates from 84 percent to 94.6 percent.

The right answer for you is likely to be with your next opportunity, whichever that might be. As a guide, DAU has developed the Services Acquisition Mall (https://sam.dau.mil), which is also designed to provide the acquisition workforce with an easy-to-access and understand site providing training, templates, and tools to develop effective services acquisitions. Additionally, DAU has developed a targeted training tool, the Services Acquisition Workshop, for developing and executing performance-based services requirements. The 4-day SAW is designed as just-in-time team training to facilitate a specific acquisition team and its requirements through a seven-step services acquisition process directly applicable to its requirements.

What's Next?

Carter stressed the importance and high dollar value of the service acquisitions as never before and issued us a challenge. As an acquisition workforce, accepting this responsibility means we must invest in ourselves through training and practice to make the needed improvements to lose our "amateur status." We challenge you to make programs more affordable by using the tools outlined here.

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Quality Assurance Tools for the Engaged Program Manager

Mark Gindele

Economic downturn, changing technology, smaller defense budgets, initiatives promulgated years ago by Vice President Gore for more commercial off the shelf (COTS) items—all have played an impact on sustaining existing military systems. Some acquisition managers have tried to include all of these environmental influences into an obsolescence program, as these all have the same effect on limiting the ability to replenish your supply system. As an active program manager, you'll hear of some of these supply problems in your regular meetings. And you'll be required to provide direction to a solution.

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For critical safety items (CSIs), your engineering team will have to provide an approved source and assure, at a minimum, that a government source inspection is part of the acceptance process. But this is no guarantee the delivered parts will be usable. Indeed, the Product Data Reporting and Evaluation Program (PDREP) maintained by Naval Sea Logistics Center is replete with procurements gone awry. Despite the best intentions of acquisition teams, you'll find large quantities of products that do not meet the requirements of the customer. Products that are manufactured, marked, or configured incorrectly—they'll all be there in the Product Quality Deficiency Reports. Read these, and you'll also discover that the products were often delivered late, in addition to being of poor quality.

As the program manager, you'll be presented with the situation where the need for a product remains; the demand is still present. You'll find that other procurement vehicles were tried and did not result in successful deliveries. You may also find that there are open contracts for the product, and your team doesn't have high confidence that the vendors will deliver. You can review the current situation and ascertain approximate pricing, including historical costs and possible expedited pricing data. As these unique products are not readily available—otherwise, you'd have already chosen that route—you can expect that the lead time for delivery will be long. After all, some supplier will have to obtain the material, fabricate and process, shape, paint, inspect, mark, etc., before presenting to the government for inspection and acceptance.

While there are some immediate actions that can be taken to meet the current demand, such as cross-decking parts from other platforms or cannibalizing parts from out of service equipment, the program manager should strive to find a reliable supply source. Whether the source is organic or commercial, there are tools that can be used to initiate a contract, give the contract the best odds of delivering quality products, and guarantee the acceptability of the product before turning it over for use. Each of these tools has a complexity, cost, and schedule factor, so it is important to understand the benefit of each.

Specific Tools to Increase Probability of Product Success

An important and integral part of any procurement is the quality assurance provisioning. Specify inadequate quality assurance, and you may end up with products that cannot be used by the military customer. Overspecify the quality assurance provisions, and you waste money and may alienate the vendor and the Defense Contract Management Agency (DCMA) personnel, who are usually assigned quality oversight. Careful consideration should be expended to evaluate all the tools available at the time of contract planning to arrive at the level that is appropriate.

Not all tools are appropriate for every application. This isn't the right time to check all the blocks under the quality assurance heading for your solicitation plan. There is great risk in assuming that some tools are in place because "it's a government contract." Although the government might eventually be made whole by a vendor that delivered unacceptable product, years will pass before you as the program manager will ever hear the news. There is also risk in assuming that a vendor's reputation based on past performance is sufficient to satisfy quality assurance needs. Procurement history will show this is often the premise for a poor decision. Vendor name recognition or large size does not always correspond to high quality for every product.

Following are the tools available to the program manager, along with a description of each and the author's rating of the tool and its cost benefit.

Site Survey

A site survey can be a very beneficial tool in determining if the facilities are in place for producing a product. In today's world, where you could receive a bid from a virtual company, an actual hands-on visit can and should be used. To make this trip of value and avoid the impression of a government-paid vacation for acquisition support personnel, determine and select your visiting team appropriately. Consider bringing, from quality assurance, a knowledgeable person to review the contractor's inspection system. If you are buying precision components that require three-decimal-place tolerances, a quality person who has experience measuring these types of products will be beneficial. Likewise, if you have a requirement for non-destructive inspection, take a person certified in these areas to review the vendor processes and inspection equipment. Because many vendors use third-party subcontractors, plan to address this in your site survey.

If you are buying quantities of items, plan on evaluating the ability of the production facilities to produce products at the rates needed in the contract. Large lots often require more au-

tomation. Have someone who can interpret computer numerical control based production and inspection. Don't forget to get assurance from the contractor that the facilities where the product will be manufactured are the facilities you want to review. All vendors today subcontract some portion of their award to others. Concentrate your survey on the most important aspects or the areas of highest risk to produce the product. You can find these focus areas in prior product deficiency reports. An outstanding information source for planning your trip is the DCMA. They may be able to provide past site surveys, industrial reports, and firsthand insights, and can complement your team with subject-matter experts.

To benefit from a site survey, you need to spend time researching and planning. The first step of a survey is not the call to the travel agency. Don't spend more money on the survey than the product will cost. For the most part, site surveys can be avoided.

Post-Award Conferences

The post-award conference is by far the most valuable, high-return-on-investment tool for ensuring a successful delivery. It occurs after contract award but before the contractor starts work. As most vendors are anxious to get started, the window for this event is narrow. The post-award conference, which can be conducted by telephone, should include personnel who understand the drawing and specifications (technical); the contracting officer who issued the contract (and can explain the wording in the contract); the on-site government representative who will be monitoring the progress of the vendor; the program manager; and the vendor's team.

This is the opportunity for all to review the contract clause by clause, delivery schedule, specifications, drawing interpretations, and special provisions. This is not just for the vendor's benefit, as it gives the program manager and technical team a hands-on review of what actually ended up in the contract (which may often surprise the government technical and quality team!). You can exchange names and contact information which can alleviate bottle necks later. A post-award conference may take less than 2 hours and will save volumes of energy later.

Pre-Award Conferences

These conferences are meetings where the government and potential contractors can get together and clarify statements of work and other information. It is a superb way to manage expectations for both parties. They serve especially well to explain tasking that is not clear in the solicitation. These work best when the work or contract structure is new or unique. It is especially welcome for new vendors. It gives the government and the vendor one last time to clarify language before bidding on the contract. For the most part, these can also be conducted by telephone.

Customer Feedback

In the Defense Department, feedback can be collected from reading deficiency reports readily available in the PDREP database. These are searchable by cage number, contract number, part number, and other means. They sometimes reveal company quality trends that can alert you to areas of concern. This database is frequently used to determine sourcing of products.

There are some caveats. Many companies have multiple cage codes, so it is important to investigate the correct location where the work will be performed. Newer companies may have no deficiency reports, which may lead you to a false sense of quality about a company. Other companies may have many deficiency reports but that may be reflective of being in business for a long time and a large business base.

To take advantage of this quality information, you need to read and interpret each report for applicability. There are many reasons why the quantity alone should not be used as an indication of the quality of a vendor's product. Many times, the deficiency report cites a system level part number rather than the specific part number where the actual deficiency is located.

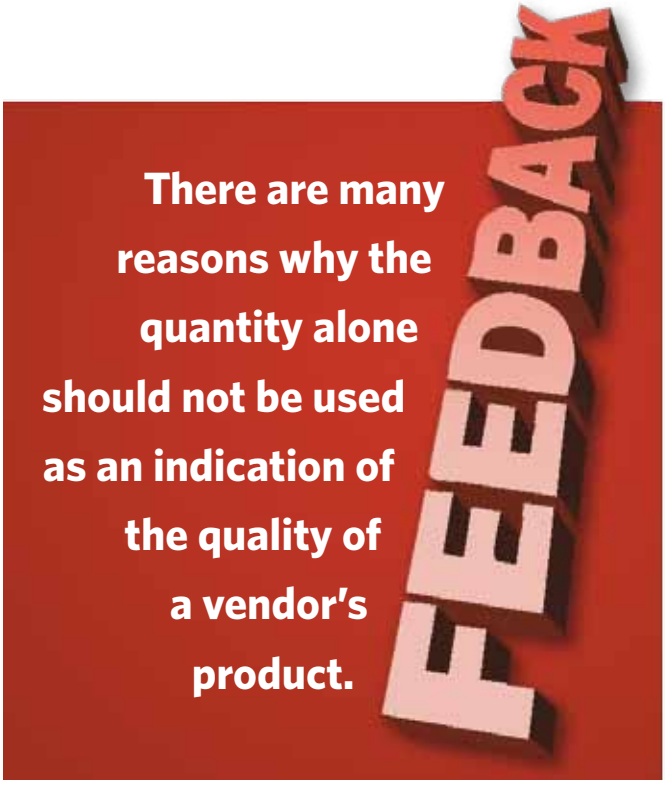
Someone also may process a deficiency report and the final disposition will indicate that the vendor cited on the initial report was not at fault. Another significant observation with deficiency reports is that it is labor intensive to collect the data and enter it into the database. For this reason, many in the community who use the parts and find the defects do not process deficiency reports. The bottom line for using this information is to read each report for applicability to your product.

Quality Assurance Level of Instruction (QALI)

Often pronounced by its acronym, "kwol-eye" isn't the fighting friend of Princess Kitana in Mortal Kombat. This QALI is a unique government to government letter that is sent to the DCMA quality assurance representative (QAR) for the vendor that received the award. In conjunction with both Federal Acquisition Regulation 52.246-2 and FAR 52.246-11 clauses in the contract, the QALI should be prepared by the technical authority and sent via the contracting officer. When written properly, the QALI will emphasize the importance of the contract and make sure that the QAR will monitor the progress of the vendor. It should guide the QAR in ensuring that appropriate specifications, features, inspections, and testing are verified by the DCMA team.

When quantities are specified, the QALI should stipulate the sampling rate to be followed for the classification of characteristics on the drawing. Usually, these rates will be different for critical, major, or unclassified characteristics. The QALI can state that the QAR has to personally witness specific processes, such as welding inspections or passivation of metal.

The QALI serves to heighten the alertness level of the QAR that a particular contract requires special attention. It should be written with consideration that the QAR has other work to do in addition to this contract oversight. It should be easy to follow, making it easy for the QAR to plan government source inspections throughout the manufacture, marking, packing,



and delivery. As most vendors use subcontractors, the QAR will have the responsibility to delegate those parts of the QALI to the QAR at the subcontractor locations. Clear and precise language in the original QALI will help ensure a successful inspection and oversight plan.

From a cost standpoint, the QALI is inexpensive. It should always be used for critical items or items that have complex processes. It should be used when you have had an unacceptable failure rate, so that other vendors can make the product correctly. It should be used when delivery and schedule delays will impact the ability of the military to execute their mission. It should be written before the contract award, so that the letter can be sent within 5 days of contract award in order to have benefit. Lastly, the QALI should be acknowledged by the QAR so that exceptions can be addressed.

Third-Party Verification Inspections

For most of the military parts and systems, an adequate inspection program can be established with the vendor and DCMA oversight. Inspections and product verifications are conducted at vendor facilities using vendor inspection tools. This is the preferred and most cost- and schedule-efficient method.

There are times, however, when third-party inspections are warranted. These would include scenarios where the consequence of a failure could cause an extreme catastrophic event and the probability of the event is high. There are limited examples of these programs, given the high cost to maintain them.

One example of this type of a program is the Navy's Level 1/ SUBSAFE program. Following the loss of *USS Thresher* in 1963, for which the failure of a salt-water piping joint was cited, the Navy implemented a stepped-up quality program to ensure that critical systems were manufactured under rigid control. After the loss of the *USS Scorpion* in 1968, the inspection requirements were reinforced under the Navy's SUBSAFE program. The SUBSAFE program continues to require independent verification and certification of critical parts.

Third-party systems are expensive, add schedule, and require knowledgeable and skilled employees to execute. Program managers have to safeguard strict definitions to assure that parts don't get added to the "must inspect" lists unnecessarily. It is not unusual for the cost of the inspection to exceed the cost to produce the product. Program managers should consider use of this option for limited application, only until a more efficient process and supply channel can be established.

A third-party inspection program should be managed by a cost-conscious manager. When these programs are unmanaged, the default position is often to inspect every part and feature. This is not necessary, as some features can be sampled, and some features will not affect performance or safety. A great deal of savings can be gained by better management.

First Article Test

First article testing (FAT) can ensure that the contractor can furnish a product that conforms to all contract requirements for acceptance. It allows you to verify capability before committing to a single vendor for a large quantity. On most occasions, FAT will increase schedule and cost. To manufacture one item is usually very inefficient, so the cost to include FAT has to be considered. On the other hand, if you waive FAT, then the contracting office is committing more to a vendor that may not be successful.

There are some options worth considering before signing up for FAT. It is terribly inefficient for a vendor to use equipment that would be used to manufacture quantities to produce only the FAT item. Acquisition regulation allows the contracting officer to approve subsequent lots before FAT approval and to provide payment for certain material needed beyond that needed for FAT. If your industrial experts understand how the vendor will make a specific item, it is better to structure your contract accordingly.

To illustrate: The current requirement is to manufacture 300 critical fasteners used in the hub assembly of a propulsion system. The product is well designed and has been produced before by other suppliers. And while tolerances are tight, it is the consensus of the industrial team that the vendor has the capability to manufacture. The most likely manufacturing plan for the vendor will be to secure the material for all 300 items. A manufacturing plan will be developed whereby fasteners can be made in batches consistent with machine capability and manpower. Product will be produced in lots—i.e., five or 10 at a time would be nominal.

For this example, FAT would not be recommended. Products covered by previously developed complete and detailed tech-

nical specifications should consider alternatives to FAT. A very practical alternative is the use of a complete inspection of the first lot. This type of testing, a modification of production lot testing (PLT), allows the vendor a more realistic way to manufacture product in an efficient way. By inspecting the first lot in great detail, you can make slight adjustments in future lots if necessary. You can also gain confidence in the entire process.

Certifications by Third Party

A Certificate of Quality Compliance (COQC) can be a valuable clause in contracts to alert the contractor that certifications are required for the material described. It is especially of value for the technical team in ensuring the product is in compliance with the specifications. These certificates provide reasonable, objective evidence that the part has the integrity needed. Unless otherwise stated, the certificates should be listed as documents to be delivered with the products listed in the contract. If this clause is invoked, it is absolutely important to have someone read and interpret the documents by comparing the certification with the specifications in the contract. Unfortunately, it is not uncommon for the certification furnished with the product not to match the product drawing.

Some common certificates are those that specify the origin of the material used to manufacture the parts; certifications of personnel to perform specific tasks, such as welding and non-destructive inspections; and certifications regarding testing and inspections—e.g., heat treatment or passivisation of metal or radiographic, magnetic particle, dye-penetrant, and ultrasonic testing.

These certifications are an inexpensive means to ensure the product is made correctly. As long as the requirements for the certifications are included in the contract, the vendor should flow this requirement to his or her subcontracting team.

Conclusion

These common quality tools, used in the proper mix, can go a long way toward ensuring product integrity. There are other methodologies that can help outputs meet contract requirements, including process reviews, system and company audits, quality-system evaluations, management and program reviews, and progress reports. In today's environment, where some of America's best suppliers are also exporting precision products to companies overseas, DoD is competing for limited manufacturing capacity at private facilities. Sometimes these companies argue that the government's oversight greatly exceeds other customers' needs for similar precision products. It therefore becomes the burden of the program manager and his or her team to balance quality assurance, vendor base, and performance risk. When a vendor refuses to cooperate with all the requirements in a solicitation, the program manager has to find a solution.

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How Acquisition Training Has Changed Since We Were Certified

Wes Gleason ■ *Steve Minnich*

When the Defense Acquisition Workforce Improvement Act (DAWIA) was enacted in the early 1990s, we both had many years of acquisition experience as federal employees. In the early days of DAWIA, many people, especially those with at least 5-10 years of experience, were "grandfathered" into their career field through the fulfillment process. Basically, we provided justification as to why we already had the requisite knowledge for our respective career field, got our justification approved, and received our Level III certifications. Many others got their DAWIA certifications by taking just a few courses. These courses were typically "death by viewgraph" and involved minimal student participation. The only requirement for graduation was to attend class. Over the years, not only have the certification requirements become more rigorous, the classes have also evolved.

Why Write This Article?

This article is a follow-up to "Acquisition Training: A Lifelong Process" (*Defense AT&L* May-June 2010). We intend to focus primarily on explaining today's level of material coverage, level of participation, and level of testable knowledge in DAU acquisition and program management courses. We will describe how the courses have changed over time and discuss the need to view these courses as an essential part of career development. We will also address the importance of appropriate timing of courses, with less demand from the workplace during training, and an

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overall emphasis on ensuring the workforce is getting the training when it is needed.

Additionally, we will discuss the need for workforce members who received their DAWIA certifications many years ago, to keep current with the latest changes in defense acquisition. Having received our initial DAWIA certifications through "grandfathering" and courses taken years ago, we have seen first-hand how fast the acquisition system has changed, and how difficult it is to stay current. This point was driven home in the training we received to become qualified instructors at DAU (the subject of our earlier article). Although there are requirements to participate in continuous learning; until recently, nothing mandated what those courses must be to keep the certification up-to-date. Section 874 of the FY2011 National Defense Authorization Act now mandates the Under Secretary of Defense for Acquisition, Technology, and Logistics establish new requirements for continuing education and periodic renewal of an individual's certification. With this congressional mandate, we want to encourage the previously-certified acquisition workforce to take refresher training commensurate with their experience level and job related needs.

How Are the Courses Different?

Before discussing the courses available, it's important to understand how the courses have changed. Today's courses are more dynamic and focused, requiring more interaction between the students. Many of the courses are designed to model an integrated product team (IPT), with the students alternating roles on the IPT throughout the course. Most courses now have open or closed book exams, and the students are required to demonstrate a level of mastery of the material to pass. It is important to realize that not all students pass their courses. The reasons are varied but success can be aided by ensuring students meet the prerequisites for each class and, most importantly, have the appropriate acquisition experience prior to attending the course (i.e., do not attempt to take the higher level classes, such as 300-level, with only 6 months of acquisition experience).

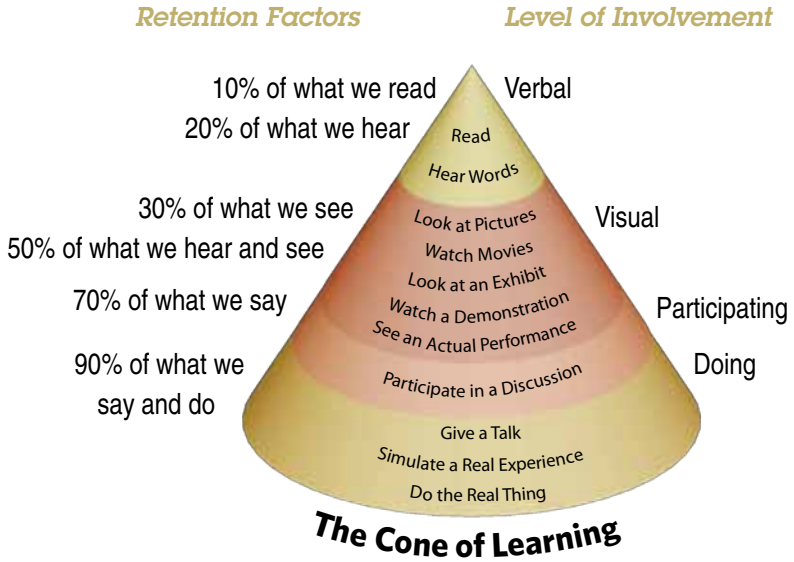
Courses are now created with greater levels of participation and "doing," vice listening to lectures and reading viewgraphs. Students are instructed on the major points of a focus area and given a problem to solve. They then have breakout sessions with their IPT and, working collectively together, are asked to develop a solution and

then present that solution and supporting rationale to the class. This construct is one of the drivers in why having the appropriate level of experience is essential; without it, the students have difficulty making significant contributions during the team exercises or miss the relevance to their job assignments.

Interactions within the group, with other classroom IPTs, and with the instructors also greatly increase students' retention of the material. By having the IPT give a formal presentation to the class, students have even more of an opportunity to retain the material. As shown in Figure 1, retention factors are greatly increased with additional participation and "doing" exercises in the classroom.

Working as IPTs allows the students to participate in a smaller setting within the classroom. During this time, they work on consensus-building by developing an answer to the exercise that they, as a group, can support. In addition, they learn the concept of synergy more by working in their groups than if they performed the exercise individually. While some students have trouble transitioning to this type of learning environment, this approach provides them with an increased opportunity to hone the skills needed for successful program management.

Figure 1. The Cone of Learning



Source: Adapted from the National Training Laboratory

Second Time Around

We have conducted several interviews with acquaintances and former coworkers we have recently seen in the classroom. Each person we interviewed received his or her initial DAWIA certification through "grandfathering" or courses taken nearly 20 years ago. Each person is now retaking courses for additional certifications or refresher training. We were interested in understanding how they perceived the changes—for the good or otherwise. As we discussed their experiences in the classroom, we noted very similar comments. Each viewed the changes in the material, the teamwork required, the emphasis on student-led learning, and the amount of testing required as changes for the good. However, another common theme was they did not believe enough information was flowing to supervisors and team leaders with respect to the current course demands and increased importance of sending students at the proper time.

The Right Time for Training

So when is the right time? The maximum benefit can be achieved when the student has the time to devote their undivided attention to the course, and when their experience level is consistent with the course being taken. Unfortunately for many students, the benefits of training can be diminished because they have either "too little time" or "too little experience" when coming to class.

Too Little Time: Many students come to class expecting to keep up with their current workload while attending class. After all, with smart phones and other wireless devices it's easy to stay connected to the office 24/7. While we recognize that workplace demands don't stop, they can be a significant distraction for students. As we have discussed, the construct of today's classes require a greater level of participation. With students doing team exercises, briefings, and reviewing material covered in student-led instructional periods, some students just cannot grasp the material if they are distracted with work from outside the classroom. These outside distractions have a negative effect on the learning outcome and can result in academic failure. When in class, training needs to take priority over outside work.

Too Little Experience: Other students come to class too soon in their acquisition career. This results in students either learning information before it is needed or not being able to contribute because of lack of experience. This is no different than taking a course without the correct prerequisites. As engineering students, we both remember taking calculus-based physics while taking calculus. Sitting in our physics class, we would start working a problem which suddenly became impossible for us to complete without the prerequisite knowledge of calculus. We see students today taking 200-level classes who graduated from college less than 6 months ago. We have students in 300-level courses without the experience normally required to take the course. Most career fields require 2 years of acquisition experience for Level II certification and 4 years of acquisition experience for Level III certification.

While we understand the desire to complete DAWIA training as soon as possible, we find that students often don't realize how much their experience contributes to the overall learning

outcome. Many of today's classes rely on students sharing their experiences to help make the link between an academic solution and real world application. Further, we find that students have difficulty comprehending the material when they cannot relate it to something they have experienced. Even if they do comprehend the material, if it doesn't relate to what they are currently doing, it may be forgotten by the time it's needed. Taking 200-level and 300-level courses without the required experience is in advance of need and in most cases will not result in a positive learning experience for the student. To help determine the appropriate background and experience for a course, DAU's iCatalog contains course descriptions (including target audience) and core certification standards for each career field. Using the iCatalog as a guide, supervisors and employees can schedule training when it will provide the most benefit to the employee and the organization.

What Training Is Available?

If you received your certification years ago, you may not be aware of all the training resources currently available. Do you have an iPhone or iPad? If so, do you know you can access videos on a variety of acquisition topics from iTunes University? This is just one example of new training resources available to the acquisition workforce. But let's start with the core certification classes.

Most career fields start with basic 100-level courses taught online. The value of these courses is dependent upon the adult learner working to understand and master the material. These online courses have instructors available to answer questions and work with students having trouble understanding the material. As students progress to 200- and 300-level training, the courses tend to have both online and classroom segments. The online portion provides the foundational knowledge while the classroom portion provides application from an IPT perspective. We highly encourage students to complete the classroom portion within 6 months of completing the online portion. After more than 6 months, we have found that students either don't retain the depth of the knowledge required to work the exercises, or are not current with the latest acquisition laws, regulations, and policies. Students in the acquisition/program management career field may progress to 400-level training. These courses are classroom only and are focused on strengthening the analytical, critical thinking and decision-making skills of current/future program managers.

Continuous learning courses are available online and are targeted on topics of interest in specific areas. These courses can be as short as an hour to several days in length. Continuous learning courses can be used to earn continuous learning points as part of the 80 hours required every 2 years. To use these courses for continuous learning fulfillment, the student must take the course for credit. This translates to the student having to take every module and passing every test. Continuous learning courses can also be used as a reference. Let's say you are coming up for a major technical review on your program and you haven't participated in one for a long time. You can browse the "Technical Reviews" continuous learning course (CLE 003) as a way to refresh your knowledge on the latest changes dealing with technical reviews. If you want to just browse a specific continuous learning course, you're not required to take the tests or read every module in the course. Just read what you want to learn! You must realize, though, this method does not allow you to earn continuous learning credits.

Rapid deployment training is available for organizations, and includes topics such as the Weapon System Acquisition Reform Act, DoDI 5000.02, and the Joint Capability Integration and Development System. As experienced acquisition professionals, these are topics you should know and understand, but you often don't have the time to read all the details to stay fully informed. Rapid deployment training is developed concurrently with new acquisition laws, regulations, and policies, with the intent of providing the workforce with immediate critical information.

Targeted training is also available, and includes a wide range of business, contracting, program management, engineering, logistics, and professional development topics. These classes are intended to fulfill the specific training needs of an organization. Let's say your program is getting ready for Milestone A and the program team wants training on how to write a good Systems Engineering Plan. The program team may consider taking "TTE 005 Systems Engineering Plan" targeting training course to fulfill the need. If your program is getting ready for a source selection, then "TTC 005 Source Selection" may be a course to consider. In addition to these "off the shelf" courses, other targeted training courses can be developed to meet the unique training needs of your organization.

Conclusion

Much has changed since the early days of DAWIA training. Courses have transitioned from lecture-based learning to more interactive, exercise-based learning where students must demonstrate critical thinking skills to solve acquisition problems. These changes drive an increased need for students to come to class fully prepared and ready to engage. Other changes include the expansion of available formats. Students can now download podcasts or take continuous learning modules anytime, anywhere there is an Internet connection. Rapid deployment training and targeted training opportunities are also available to keep organizations current with the latest process changes and to meet organization specific training needs. Even if you already have your required certifications, we encourage you to take advantage of the new training opportunities available. It's always nice to have a highly experienced acquisition professional in class to share lessons learned and best practices.

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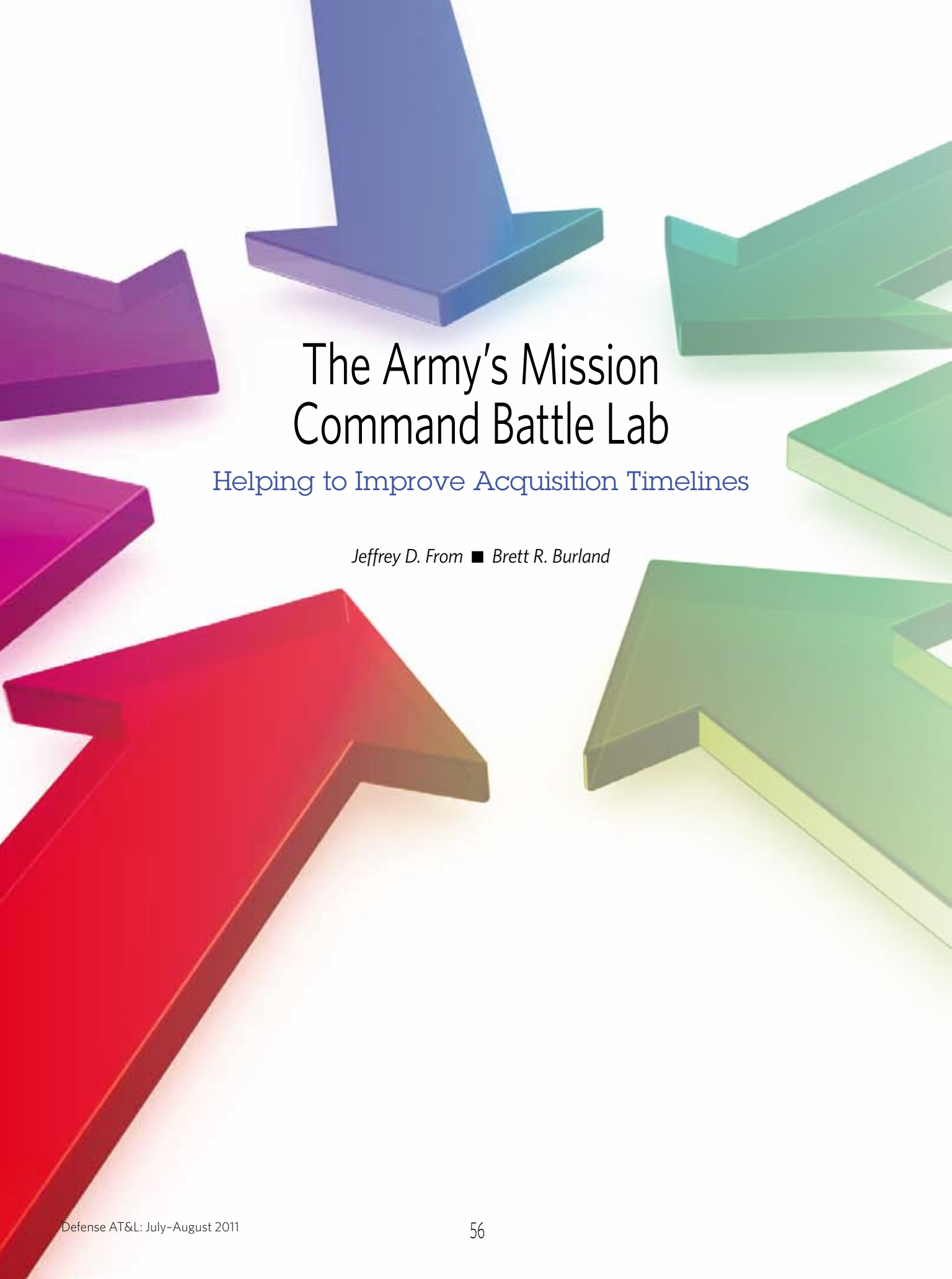

The Army's Mission Command Battle Lab

Helping to Improve Acquisition Timelines

Jeffrey D. From ■ *Brett R. Burland*

The mission of the Mission Command Battle Laboratory (MCBL) is to mitigate risk to current and future Army forces by examining and evaluating emerging concepts and technologies through experimentation, studies, and prototyping, while informing the combat development and acquisition processes. MCBL collaborates with the Army's Research Development and Engineering Command (RDECOM), the Defense Advanced Projects Research Agency (DARPA),

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The Universal Collaboration Bridge (UCB) is a simple concept that essentially enables different chat systems to transparently interoperate.

Joint Forces Command (JFCOM), academia, the National Laboratories, industry, the Army acquisition community, Command and General Staff School (CGSS), and other organizations and allies around the world. Through this collaboration and process simultaneity, the MCBL is working to improve acquisition timelines and get capabilities to soldiers faster.

The several battle laboratories and experimentation and analysis elements in the Training and Doctrine Command (TRADOC) are the principal organizations for Army experiments and science and technology (S&T) endeavors. This article focuses on the efforts of Mission Command Battle Laboratory, Leavenworth, but all of these organizations do critical work supporting concept and capabilities development.

The process for linking S&T developments to Army programs of record can be confusing. In fact, there are multiple paths any given technology can take to reach the hands of soldiers. Whether it is a commercial product going through the Rapid Equipping Force (REF) Office or a DARPA product transitioning through experimentation to become an acquisition program of record, most promising technologies identified by the battle labs do get to soldiers. However, most materiel developers would agree that the transition time is too long. This article is not intended to document these paths but to highlight the critical role the Army Battle Labs—the MCBL in this case—play in reducing the time required to get needed capabilities in the hands of soldiers, regardless of the path.

First, it's important to highlight the key activities of the MCBL. Primary among these are executing experiments, demonstrations, evaluations and, in some cases, providing technology readiness level (TRL) assessment. From small, focused demonstrations and evaluations to large experiments, these structured events provide valuable feedback to S&T developers, informing their work and in turn increasing its quality for a more complete product. In executing these events, the MCBL serves as a conduit between warfighters, systems developers, and the S&T community, fulfilling its collaboration and process simultaneity missions. It isn't difficult to visualize how bringing the S&T community, warfighters, and the material developers together at one experimentation venue can compress the time to develop systems. The rapid feedback and collaboration enable a more comprehensive and timely "test-fix-test" environment, enabling for example, materiel developers to better understand user requirements and technical transition issues.

Figure 1 depicts a comparison between the standard development timeline and a compressed pre-milestone (MS) C timeline resulting from this focused and intense S&T management and collaboration. The figure illustrates how improving pre-MS C development time can improve overall capabilities deployment/fielding times.

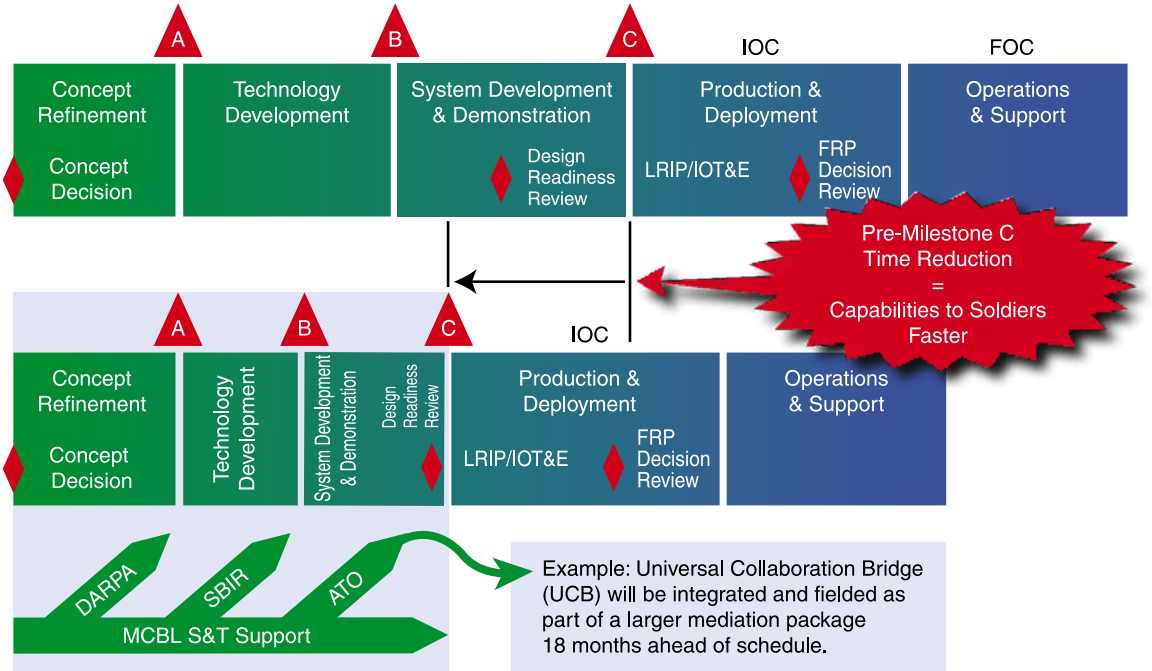
It is also well documented in acquisition literature that involving the warfighters early in systems development can result in significant resource savings and systems that better meet the needs of the warfighter. According to MCBL Deputy Director Calvin Johnson, "The MCBL has executed experiments involving S&T developers and the acquisition community's program managers from related program(s). These 'integrated' experiments are great venues for bringing key players together and facilitating early learning. And that's a great thing for the Army." The bottom line is that the MCBL is helping reduce the acquisition timelines for valuable capabilities and technologies through its close working relationships with S&T and acquisition organizations, as well as the Army's CGSS for input and warfighter feedback. No other venue in the Army can compare to MCBL and Fort Leavenworth with its potential for the richness of input and feedback related to Mission Command systems, concepts and capabilities.

Understanding the MCBL's role and conceptually how it can help to reduce acquisition timelines, we can now look at a specific example. The MCBL is the operational sponsor for the Collaborative Battlespace Reasoning and Awareness (COBRA) Army Technology Objective (ATO). The COBRA team is working on myriad technology programs, but their work on the Universal Collaboration Bridge (UCB) is a great example of the MCBL's ability to serve as a capabilities development conduit.

In May 2010, the MCBL planned and hosted the TRADOC-sponsored Talon Strike/Omni Fusion (TS/OF) experiment. TS/OF 10 investigated UK-US battle command interoperability between a 2010 U.K. Joint Medium Weight Capability Brigade and a 2010 U.S. Modular Force Division. Additionally, it provided an assessment of current and future force Battle Command capabilities to enable a more effective and interoperable U.K.-U.S. coalition force. This experimentation venue, where extensive collaboration was required between disparate forces (a U.K. brigade in England and the U.S. division in the MCBL), was a perfect fit for the UCB technology.

The UCB is a simple concept that essentially enables different chat systems to transparently interoperate. The COBRA team designed the tool so as not to require any changes to

The Impact of MCBL S&T Support



the existing chat software; clients or servers. UCB bridges together instant messages, chat rooms, and user presence and has demonstrated interoperability with: mIRC, Jabber/XMPP, CPOF native chat, web chat, and VMF free text. In TS/OF 2010, the UK Brigade was using open fire/J-Chat and the U.S. Division at Fort Leavenworth was using mIRC chat. UCB was employed on a server at the MCBL/Fort Leavenworth and operated transparently to the experiment role players.

The TS/OF 2010 experiment allowed the material developer, the Communications-Electronic Research, Development and Engineering Center (CERDEC), to identify issues and fix issues that would not have been apparent except in similar large-scale use. Specifically, the test revealed the UCB was not handling socket buffer overflow conditions adequately. This was fixed during the exercise, and UCB was able to work continuously after applying the fix. Other system parameters, (e.g., bumping max queue sizes, timeout values, etc.) were "tuned" to support the large-scale environment. After several iterative, on-the-fly adjustments, the UCB functioned as intended. The MCBL experiment afforded the CERDEC team the opportunity to make several adjustments (e.g. a test-fix-test environment) in a short period of time. Additionally, valuable feedback was provided to the developers from the MCBL technology support team and Army role players.

The UCB as of press time was scheduled for transition to Project Managers Battle Command (PM BC) and Force XXI Battle Command Brigade and Below (FBCB2) in May-June 2011 as a "bundled" mediation solution with another COBRA ATO product targeted at data mediation. The two products will be integrated with the PM BC's next generation data mediation products under Product Manager Common Software (PdM CS), and UCB will focus on FBCB2 chat interoperability. This timeline is considerably advanced, given that the COBRA ATO doesn't end until 2012 and products and new capabilities would normally transition at that time. "The UCB technology was tested and matured in a rapid, agile environment and this was made possible by the collaboration and process simultaneity afforded by the MCBL," said Michael Anthony, CERDEC COBRA ATO manager.

Warfighters should see the UCB functionality nearly 18 months ahead of the normal transition. Similar work is taking place now with other ATOs and S&T projects throughout CERDEC and DARPA. And the MCBL will continue to get them in front of warfighters as early as possible.

In summary, the MCBL provides valuable support to the acquisition process. By leveraging the myriad complementary organizations and providing a venue for collaboration and timely warfighter feedback, the MCBL can provide valuable and tangible data to support faster development builds and systems, functionality and capabilities that better address warfighter needs. Through its experimentation capabilities and broad reach into the S&T and acquisition communities, MCBL can reduce the time developing technology, engineering, and manufacturing in the acquisition process. More specifically, the MCBL provides a venue to expose new technologies to Army warfighters, providing timely input to development efforts. The ultimate result from this aggressive S&T involvement in systems development is critical capabilities in the hands of the warfighter faster.

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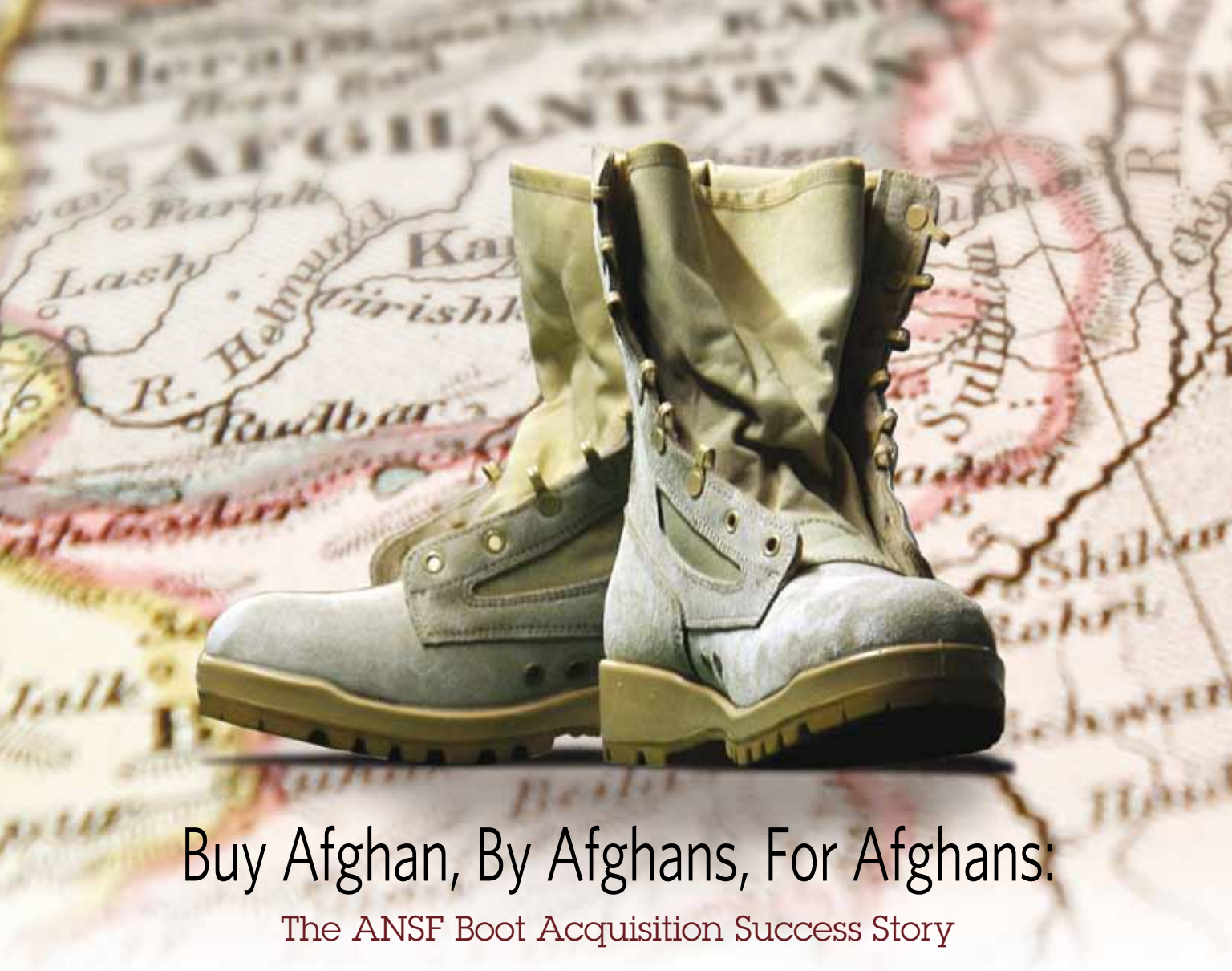

Buy Afghan, By Afghans, For Afghans:

The ANSF Boot Acquisition Success Story

Maj. Darren W. Rhyne, USAF

An army is said to march on its stomach, and it literally marches on its boots. The Afghanistan National Security Forces (ANSF) are no exception. The ANSF, with financial assistance from NATO Training Mission–Afghanistan (NTM-A)/Combined Security Transition Command–Afghanistan (CSTC-A), has had responsibility for procuring its own food since 2005. However, the NTM-A/CSTC-A Security Assistance Office–Afghanistan's (SAO-A's) Local Acquisitions Office has retained the procurement responsibility for many other war-fighting and support commodities, including ANSF combat boots. In 2010, the Local Acquisitions Office embarked on a literally ground-breaking task: Improve the quality of the ANSF's boots while establishing a boot industrial base in Afghanistan to manufacture all of those boots to U.S.-grade specifications.

Rhyne *is a professor of systems engineering management and science & technology management at the Defense Acquisition University, Fort Belvoir, Va. He was deployed to Camp Eggers, Kabul, Afghanistan, as the chief of local acquisitions, Security Assistance Office, NATO Training Mission /Combined Security Transition Command–Afghanistan, Feb. 20, 2010–Feb. 13, 2011.*

The effort to improve ANSF boot quality began in early 2010 in response to reports from fielded units of poor quality boots. Prior to that, NTM-A/CSTC-A procured boots for the ANSF from various sources and methods: One Afghan manufacturer via an indefinite delivery, indefinite quantity (IDIQ) contract, several Afghan importers via blanket purchase agreements (BPAs), and U.S. suppliers via the foreign military sales (FMS) process. Unfortunately, there were no specifications or quality controls in place for these procurements. The simple requirement was for "boot-brown" or "boot-black" at the lowest price and delivered as quickly as possible.

The NTM-A/CSTC-A Local Acquisitions Team decided to not only take steps to improve the quality of the boots but also have all of the boots made in Afghanistan, which, at the time, appeared to be an unlikely proposition. Conventional wisdom was to simply order the boots from U.S. vendors but the team, with backing from NTM-A/CSTC-A leadership, decided on a bold, two-pronged parallel approach to get boots made to the new specifications by an Afghan vendor and into the field as quickly as possible while expanding the boot industrial base to more Afghan vendors. The acquisition objectives of this approach were to produce a U.S.-quality boot at reasonable prices, foster competition among local vendors, meet needed production quantities in a timely manner, mitigate risk of sole source vendor failure, and enable the team to provide direct oversight of the program in-country.

The counterinsurgency (COIN) benefit of this acquisition approach was to improve the Afghan economy through employing Afghans in legal, sustainable, viable, and meaningful jobs, giving them an alternative to the Taliban and other illicit sources of income. Supporting a counterinsurgency campaign through an acquisition program may not be intuitively obvious, but in the case of Afghanistan (and Iraq) this approach is codified in Section 886 of the FY 2008 National Defense Authorization Act (Public Law 110-181) and implemented through the Defense Federal Acquisition Regulation Supplement (DFARS 225.77). It was also documented in the "Afghan First Policy" espoused by the top Coalition military leader, Gen. Stanley A. McChrystal, and the NATO ambassador to Afghanistan, Mark Sedwell, in a joint memo dated March 7, 2010. NATO also codified its Afghan First Policy the following month. The current commander of ISAF, Gen. David H. Petraeus, and the U.S. ambassador to Afghanistan, the Hon. Karl W. Eikenberry, also published contracting guidance related to Afghan First in 2010.

Instead of ordering boots from U.S. vendors via the FMS process, some of which took over 2 years to arrive and cost over $100 per pair, or ordering greater quantities of poor quality, foreign-made boots through Afghan importers, the team ceased all orders in January 2010 for an "acquisition stand-down" to assess the problem before implementing the procurement solution.

The team partnered with the Afghanistan National Army (ANA) in February to conduct a 30-day field test of 100 pairs of the locally procured tan boots in order to establish a documented baseline of the problems against which to develop and measure improvements. The team also sent boot samples to Defense Supply Center Philadelphia (DSCP, now Defense Logistics Agency Troop Support) for laboratory testing. After inspecting 91 pairs of the field-tested boots and obtaining laboratory test results from DSCP, the team obtained and modified boot specifications with reach-back assistance from U.S. government personnel at Natick Soldier Research Development and Engineering Center (NSRDEC) to incorporate necessary quality improvement changes.

The counterinsurgency (COIN) benefit of this acquisition approach was to improve the Afghan economy through employing Afghans in legal, sustainable, viable, and meaningful jobs, giving them an alternative to the Taliban and other illicit sources of income.

Low Rate Initial Production (LRIP) Manufacturing and Testing

Taking advantage of the existing IDIQ contract with the existing Afghan boot manufacturer, Melli Trading Limited (Ltd.), the SAO-A boot program manager (PM), USAF Capt. Adam J.J. Pudenz, worked with Kabul Regional Contracting Center (KRCC) to modify the contract to incorporate the new boot specifications. The PM and KRCC also placed a low rate initial production (LRIP) order to Melli Trading Ltd. in March that allowed it to develop its manufacturing process for the new specifications with Defense Contract Management Agency (DCMA) field representative oversight and produce a sufficient quantity of boots for field and laboratory testing. Melli Trading Ltd. produced over 2,500 pairs of "Kabul Melli" tan boots in spring 2010 under a LRIP quality improvement program monitored by DCMA, KRCC, SAO-A, and ANA representatives. ANA and the new Afghanistan National Civil Order Police (ANCOP) personnel field-tested

these boots during their basic training at three separate sites in Afghanistan and DSCP tested samples in their laboratory in Pennsylvania.

Field and laboratory test results and inspections of more than 295 pairs of these boots in June 2010 showed marked improvements over the previously tested boots. All major failure areas, some attributed to poor design/manufacture and some to soldier actions, from February field testing had extreme decreases, with five of seven areas reduced to 5-percent defects or less. Ankle nylon and side-vent nylon experienced no failures, whereas 46 percent and 7 percent, respectively, of the old boots experienced these failures. The newly designed boots had a 1-percent failure rate for ankle seams, compared with a 45-percent failure rate in the old boots. Loose eyelets and side vent seam failures were reduced from 30 percent to 5 percent and 19 percent to 5 percent, respectively. The two largest failures in the old boots, sole wear and sole de-bonding, were reduced from 78 percent to 41 percent and 77 percent to 21 percent, respectively. Changes in problems attributed to ANA soldier actions were mixed with the new boots. Cutting of boots was reduced from 12 percent to 0 percent, while coloring of boots increased from 5 percent to 16 percent. While the reduction in boot cutting could be attributed to better ventilation incorporated into the new boot design, it was unclear why there was a three-fold increase in boot coloring. Overall, 30 percent of the new boots had no problems compared to only 3 percent before, a ten-fold improvement.

Workers in the Melli boot factory construct tan "Kabul Melli" boots to the new specifications.

Photos by Staff Sgt. Marcus M. Maier, USAF

For the Afghanistan National Police (ANP), an LRIP order of 2,000 black boots to be manufactured to the new specification was placed with Melli Trading Ltd. on May 15, 2010. The team conducted a similar monitored LRIP quality improvement and testing program at ANP training sites in Kabul and Kandahar in July and inspected 280 pairs of those boots in early August. The Kabul and Kandahar training sites offered different training conditions, such as asphalt vs. no-asphalt drill pads and less vs. more marching, drill, and ceremony, respectively. It was also noted that the trainees were only issued one pair of boots and no other shoes, during their training, so wear-out was probably accelerated due to more frequent wear and use for physical training activities. However, the boots performed well in both climates and training environments. Again, all previous major failure areas had huge decreases, most reduced to 5 percent or less, and the percentage with no problems increased significantly. It was noted that the left sole of the boots from the Kandahar site wore much more than the matching right boot, which was attributed to the "half-goose-step" marching style taught to the ANP trainees. Remaining problem areas were minor manufacturing defects, including missed stitches, untrimmed threads, and loose eyelets/vents, and were addressed with the vendor before further orders were placed.

Full Rate Production

The test results of both tan and black boots indicated a vast improvement in boot design and manufacturing quality over the previous Afghan-manufactured boots and those imported by Afghan suppliers from non-U.S. sources. The Local Acquisitions team worked with the local contractor, Melli Trading Ltd., to make further improvements in the largest remaining problem areas and the vendor quickly incorporated these changes into their production process. Their responsiveness and demonstrated quality products led the SAO-A Local Acquisitions

Office to place full-rate production orders in July 2010 for 60,645 pairs of tan winter and 39,355 tan summer boots. Successful completion of the ANP field and laboratory tests in August resulted in placement of orders with Melli Trading Ltd. in August for 30,000 pairs of black summer and 30,000 pairs of black winter boots. Deliveries of the tan summer boots to the ANA central supply depot in Kabul began in early October and were completed in mid-December. Deliveries of the black boots to the ANP Interim Logistics Facility in Kabul began in late November and were completed by the end of December 2010. More orders were placed in 2011 with Melli Trading Ltd. and two other vendors (see below) to support ANP growth from 109,000 to 134,000 personnel and ANA growth from 134,000 to 171,000 personnel by October 2011.

Capt. Saifurahman Ayar (Afghanistan National Army), Maj. Darren Rhyne (USAF), Rick Moran (DCMA), and Capt. Adam Pudenz (USAF) inspect tan boot material at the Melli factory in spring 2010.

Photo by 1st Lt. Jonathan Kim, USAF

Concurrent Solicitation

In parallel with the Melli Trading Ltd. boot development and production improvement effort, the SAO-A Local Acquisitions boot PM worked with KRCC, DSCP, NSRDEC, and DCMA to incorporate the new specifications into an Afghan First, multiple-award, 5-year IDIQ boot acquisition strategy for the ANSF that was approved by the Senior Contracting Official-Afghanistan (SCO-A) in April 2010. KRCC released the solicitation to Afghan industry at the end of April. Over 20 proposals were received by the end of June, and source selection with a four-person KRCC & SAO-A team with NSRDEC reach-back consultation support began in early July 2010. The Competitive Range Determination was finalized for this source selection in October 2010 in readiness to award multi-year IDIQ contracts to two additional local manufacturers with a maximum value of $200 million over 5 years. These additional contracts were awarded in March 2011.

Way Ahead and Accolades

In addition to the award of these contracts, the SAO-A Local Acquisitions-led boot acquisition team can claim several important successes with its efforts to date. Melli Trading Ltd. is employing over 500 people manufacturing quality boots to U.S. specifications at two-thirds the cost of boots procured from U.S. vendors through the FMS process, not including transportation and FMS management costs. The success of this program has confirmed that Afghan businesses can manufacture quality products at competitive prices in a timely manner, with the added benefit of employing Afghan citizens in legal, living-wage-earning jobs. The Local Acquisitions Office is building upon the success of this program by converting other previously-imported products, such as several nylon-based tactical gear and 23 other basic organizational clothing and individual equipment items, into Afghan-made products with U.S. specifications.

The success of this boot development effort was touted by the Commander of the International Security Assistance Force (COMISAF), Gen. David H. Petraeus, in his "COMISAF's Counterinsurgency (COIN) Contracting Guidance" memo dated Sept. 8, 2010. This memo advised commanders, contracting personnel, military personnel, and civilians of NATO, ISAF, and U.S. Forces–Afghanistan to "Emulate successes such as NTM-A/CSTC-A's Afghan First program that created a boot making industry in Kabul." Even prior to the COIN contracting memo, the success of the program reached the office of Afghan President Hamid Karzai, to whom Gen. Petraeus personally presented several pairs of the LRIP "Kabul Melli" boots in July 2010.

In addition to the design and manufacturing improvement effort, the SAO-A boot PM is also working with the ANA and ANP leadership to advise their personnel on the proper wear and care of their boots which, in a society used to wearing mainly sandals, presents some cultural challenges. The NTM-A/CSTC-A Directorate of Logistics also prepared a fragmentation order (FRAGO) to U.S. and Afghan troops in the field on how to distinguish the new "Kabul Melli" boots from the old ones and how to go about exchanging old, defective boots for new ones. This wear and care guidance, training, and exchange guidance to ANSF personnel, along with a better quality designed and manufactured product made by multiple Afghan vendors, promises to provide the ANSF with a highly serviceable combat boot on par with that of Western forces for years to come. These Afghan-made boots may also one day compete on the regional and international markets with those made in other Asian countries, which would be the ultimate Afghan First success story.

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Don't Supersize!

Simplifying Defense Acquisition Reform

Maj. Marc J. Raphael, USAF

In early 2009, shortly after the latest defense acquisition reform legislation, the Weapons Systems Acquisition Reform Act (WSARA) was signed by President Obama, I decided that as a defense acquisition professional, it would be good to study the history of such reform. I had been taunted by the old adage from high school history class—that those who do not study the past are doomed to repeat it.

My research found a great deal of history, with a great deal of it repeated.

The pattern was this: Studies identified problems. Panels proposed solutions. The government directed reforms. Two of the first reform studies I read referred to over 200 other studies, panels, and reports. What surprised me was how many of the ideas generated by this excess of think-tanking were implemented. Defense acquisition reform is that rare subject that garners broad bipartisan as well as cross-government support. WSARA, for example, passed both the House and Senate unanimously, despite strong partisanship on virtually every other issue.

Raphael *has served on four MDAPs, and as a PM/COTR multiple times. He has a BS and MS in computer engineering and software engineering, respectively.*

I wondered: "Why is defense acquisition reform so uniquely persuasive—and why do these much-agreed-upon reforms appear not to be working?"

The metrics for our largest weapons systems show a near-unbroken trend of unexpected cost and schedule growth trailing back to 1950, despite more than a dozen attempts to reform the system and eliminate the trend. Perhaps, in our desperation, we failed to understand some fundamental causes and have over-engineered solutions. While many reforms do relieve stress in the system, collectively they add stress and steer the acquisition system down the path that our tax code has taken—that of extreme complexity. To rebalance, we should ask ourselves: Which remedies will have the broadest positive effects but require relatively simple and concise actions? How do we nudge rather than pummel ourselves to positive results?

Supersize that Order, Please…

I contend that the department's tendency to supersize the scope of many programs is a root cause of unrestrained, unnecessary cost growth. This is sadly ironic since many reform efforts began by scouring Major Defense Acquisition Program (MDAP) data to discover the common issue to target, while somehow missing the realization that the size of those programs is itself that common issue!

Setting desperation aside, let's approach this idea through the lens of logic:

- Every program has inherent risk.
- Programs with more functions and more complexity have more acquisition risk, all other factors being equal.
- Larger programs (e.g., ACAT-I programs) have more functions and more complexity.

Although there can be exceptions, this logic trail generally leads to the conclusion that our largest weapon system programs are inherently risk-intensive. This increased risk, moreover, is not linear, since the larger the integration scope, the greater chance a realized risk in any one area has of propagating instability across system or process interfaces. Smaller programs have this trouble too, but they also have the implicit firewall that comes with economy of scope. Their larger peers, however, generate multiple independent pockets of risk (technical, process, schedule, integration, etc.) that end up superposing with other risks, creating program-wide instability that is more than just a sum of the individual issues.

The result can—and repeatedly has—become the program equivalent of the Tacoma Narrows Bridge disaster. Tacoma Narrows is often used as proof of how spectacularly a project can fail when instability overwhelms a system not designed to tolerate it. Just as strong winds caused that bridge to oscillate with ever growing amplitude until a cascading failure ripped it apart, complex programs lacking robust and proactive risk management are destabilized in the presence of compounding risk. Often the result is a similar cascade of failures with parts of program scope being stripped away in the hope of stabilizing cost and schedule. Sadly, though the purged system has real utility, it is often less than what was intended, is behind schedule, and has squandered resources. Thinking smaller and smarter at program initiation would be a better alternative to this.

Big Deal

Program size also factors into other defense acquisition challenges. For one, it fosters consolidation in the industrial base, leaving few defense firms able to compete for our most ambitious or complex contracts, and drawing talent from other critical, but smaller efforts. Another consequence of supersizing is the extension of acquisition cycles. Giving the same scope to a set of smaller, more focused, and independent efforts would minimize delays in delivering capability to the warfighter. Expanded integration activities require their own resources and admit new risks, a key reason why even the most effective complex MDAPs miss the department's 3-to-5-year procurement-cycle goal.

One final effect of supersizing is the burden of MDAP regulatory reporting that is automatically placed on the likely already-stressed program acquisition workforce, causing them to be more outward and backward-focused on the very programs that require the most intensive inward and forward management cynosure. In some cases, the fear of this last consequence may lead programs to accept weak assumptions of low risk, even in the face of unprecedented complexity; a course which allows for artificially low cost estimates, but just delays and worsens the inevitable (which is why we should never waive an independent cost estimate, even on an ACAT-2).

One Example from a Crowd

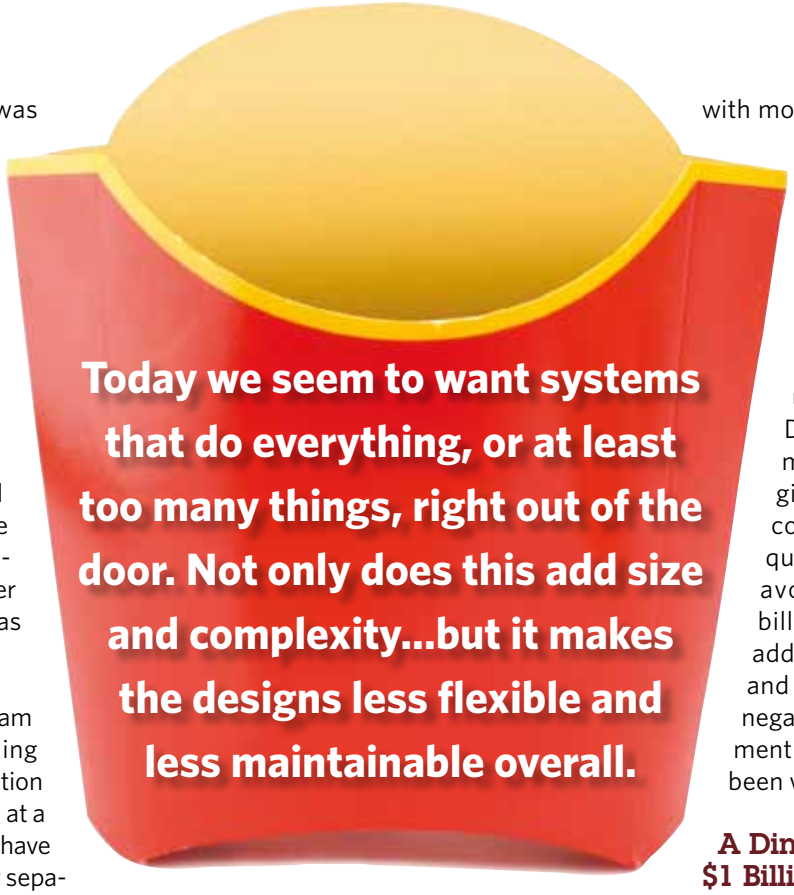
Concern over program obesity is validated by the history of any number of large programs, but only the Space-Based Infrared System (SBIRS) will be cited here, as it often is elsewhere. SBIRS, in brief, started out as heir to the Defense Support Program (DSP), but with three additional missions added. At least one initial cost estimate (approximately $9 billion) was shelved in lieu of one less than half as large.

The higher-cost estimate was shelved because of the reasonable belief that the program would not be authorized with such a high, though accurate, cost. The smaller estimate was chosen, and assumptions were provided to back it up, including: Software integration would be low risk; the system solution would just be an update to DSP; and only 42 days of schedule would be needed for slack across three years of development.

It didn't take long for the true risks and complexity to appear, invalidating these assumptions. The program, having been funded and structured based on assumed low risk, proved incapable of performing the necessary integration and risk management. All internal cost and schedule margins evaporated in attempts to address unassumed risks that had be-

come real issues. It was not enough. Just like the Tacoma Narrows Bridge, the instabilities continued to grow: In the first 5 years, the program re-baselined annually (four re-plans); these were followed by two Nunn-McCurdy breaches, with SBIRS Low being offloaded completely from the larger program of record, moving to another effort which itself was later restructured.

Today the SBIRS program of record is proceeding with a partial constellation on orbit, years late and at a cost growth that could have funded several entirely separate MDAP efforts. The current estimated cost is approximately $11 billion, yet the series of unfortunate results has not ended. The soon-to-be-launched SBIRS High GEO (geosynchronous) vehicles will be orbiting for years before being able to fully exercise their native capability, because the needed ground software budget was redirected to cover other unanticipated costs.



As a reformist community, we have looked at SBIRS and other MDAPs and made recommendations on how to move forward. Some key ideas include using risk-based source selection and certifying independent cost estimates up front. These are excellent must-do fixes that are in place today, but they skirt the key issue of over-scoping. Remember the $9 billion SBIRS estimate that was shelved? If we'd used that estimate and run a risk-based source selection on the same scope, that program likely would not have been approved. The SBIRS program was always executable, but it was never affordable. It was too big.

Divide and Conquer

If SBIRS was never affordable, what could we have done differently by recognizing that up front? For one, scope could have been carefully separated, perhaps aided by a shared interface control document (ICD) defining points of interoperability and minimizing dependency. Doing this could have won the option to defer the riskier elements in two dimensions: within separate programs' delineated scope and between the programs themselves.

This approach would have let the separate programs proceed on relatively independent acquisition schedules and with more bounded risks to schedule, cost and technology without altogether ignoring integration. This tactic would also have mitigated the biggest risks up front, rather than assuming them away; further, MDAP designation might have been unneeded, freeing our lean DoD acquisition staffs for a more proactive and strategic vice reactive and tactical course forward. Finally, and quite importantly, we'd have avoided a 15-year-long $11 billion-plus program that, in addition to delaying capability and consuming treasure, drew negative publicity on the department for years. That would have been worth something.

A Dime a Dozen—$1 Billion for One

Many of us have grown up as acquisition professionals weaned on supersized efforts like SBIRS and its 90-or-so sister MDAPs. However, we can't let that exposure blind us to believe there are no small-scale alternatives for many programs.

The B-52 is an example of a program that had a strong, flexible baseline design that was able to take on incremental upgrades for more than two generations, yet still has a projected operational life to 2040, an operational readiness rate three times higher than the more costly and modern B-2, and even cost less than $1 billion ($FY 2000) to initially develop.

Today we seem to want systems that do everything, or at least too many things, right out of the door. Not only does this add size and complexity, with all their accompanying effects mentioned above, but it makes the designs less flexible and less maintainable overall.

In contrast, look at the Surrey Institute and other similar centers of excellence for creating economy of capability. Surrey's niche is in designing and developing small satellites and having them on orbit in generally less than a year from design kick-off, and at a cost often in the neighborhood of $10M per satellite. The capability may not be state of the art, but it is competitive and what is launched can always be replaced with better technology in 2-3 years, as necessary. Instead of having a satellite on orbit for 15 years whose technology is outdated by the mid-point of that span, why not have a rolling wave of innovation? Furthermore, the small physical size of those satellites leads to lower launch costs and provides the option for multiple satellites to be orbiting at once.

Applied to DoD space needs, this simpler approach would allow the U.S. to accelerate its fledgling Operationally Responsive Space (ORS) initiative, and take a similar approach to unmanned ground, maritime and air vehicles (UGV, UMV, and UAVs).

Write On!

We see the problems. Hardly an issue of *Defense News, Defense Acquisition Research Journal*, or this publication goes by without discussion of some acquisition trouble or proposed solution. We can add these commentaries to the formal reports and studies I cited earlier. It seems that in the DoD acquisition community, everyone is a reformist, including those who call for a halt to reforming. After all, with reform being the rule rather than the exception for 50 years running, stopping reform is a rather radical change!

This school of thought has a point. Because MDAPs have long acquisition cycles and a lot of momentum in whatever direction they are headed, much of the effect of current reforms may not manifest results for years yet. WSARA's Nunn-McCurdy strengthening, for example, would not trigger on a SBIRS-sized program unless cost grows another $2B or so.

A Note of Irony

With this enlarged perspective on the effects of size and complexity on our programs (for better and worse), is it not ironic that our historic solution to cost and schedule growth is to make the acquisition system itself even larger and more complex? Wouldn't that incur a level of systemic risk on the government side of development for the same reasons? Instead, we must take the simplest, most strategic actions and defer any further accumulation of tactical reforms.

By employing stronger economy of scope on as many programs as possible, and otherwise applying processes already in place, we will make good progress. First, we initiate more programs, enabling a broader industrial base that includes smaller and more innovative firms. Second, we support our acquisition action officers as they seek to establish process stability. Third, instead of stretching out program leadership tours to provide continuity, we shrink the length of the programs to achieve the same result. Finally, we get incremental capabilities to the field faster and free up resources for the next generation of investment.

Limiting program size is a strategic fix, not a tactical one. It does not affect the momentum of our current largest weapon systems, but instead is insurance against another generation of resource-hungry MDAPs following in their wake. DoD acquisition professionals of the future should not be faced with 200 or more studies of why they cannot do their jobs, but rather by articles and accolades on how well they succeeded. We literally cannot afford for history to repeat itself.

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A Tale of Two Contracts

Illustration by Jim Elmore

The Best of Times, the Worst of Times

Lt. Col. Dan Ward, USAF

Whoa, I did *not* see that coming.

When I wrote "My Big Slow Fail" (Jan.-Feb. 2011) I figured I was just telling a story, and not a particularly significant one at that. I thought people might get a chuckle out of the challenges and frustrations involved with awarding a contract. I hoped maybe we'd all learn a little something. I never expected this comedy of errors to trigger an avalanche of e-mails from readers around the world.

Now, it's not unusual for me to get three or four notes when a new article comes out, but with this one I heard from over 30 people within a few weeks—and the e-mails just kept coming. The list of respondents includes personnel from the Army, Navy, Air Force, Marine Corps, DIA, DAU, DCAA, NATO, and industry. I even heard from a couple of CEOs. The volume, in both senses of the word, was surprisingly high.

Almost every message included the phrase "That exact same thing happened to me." Many readers shared long, painful stories of their own contracting difficulties, while others wistfully asked if perhaps I'd been secretly following

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them around, documenting *their* experiences. Could it be the story was not autobiographical as it seemed but instead was a thinly veiled recounting of Program X from Organization Y? As fun as that sounds, I must admit the story came from my own experience.

I'd be remiss if I didn't acknowledge some people felt differently. A small number of readers wrote to say the story unequivocally demonstrated my personal and professional incompetence, although one considerately used phrases like "Clearly, program managers need more training."

Thankfully for my delicate ego, sarcastic and critical opinions were a tiny minority among the people who took the time to write to me. Most people offered kind words, which is great, but what really knocked me out was how many said they'd been through identical situations (and actually used the word "identical"). This complimentary chorus of co-sufferers was simultaneously gratifying and depressing. It's nice to have company, but I sure wish these problems weren't so common.

What We Learned

The variety of lessons people took from the article was fascinating. Some people focused on the type of contract and concluded that delays, confusion, and challenges are found only in *services* acquisitions. My friends working on weapon-system acquisitions beg to differ, but it's an interesting observation. Other readers railed about the negative impact of superficial competition, while still others saw the story as validating the need for documented processes and standard work.

Yes, one or two people wrote to say they thought the moral of the story was, "Dan is not good at his job." Believe it or not, I wasn't the only writer who used the term *idiot* to describe the main character in the story, although nobody else signed their real name to that particular assessment. *C'est la guerre.*

A Balancing Act

Writing a story based on actual events involves a balancing act between the comprehensive and the sufficient. I promise I didn't invent a single fact, but I hope nobody is shocked if I admit to leaving some specifics out.

Given the constraints of time and space, both mine and yours, I limited my literary attentions to the major events, themes, and trends. This means a couple of details went unmentioned. Despite the inevitable omissions, I hope the story contained all the necessary parts: a beginning, middle and end; a cast of colorful characters; and a blend of pathos, mystery, humor, and drama. The only thing missing was a plucky sidekick named Chip.

I made sure not to leave out any inconvenient facts that would have significantly changed the story, but there is a previously unmentioned data point that may be relevant to the next level of analysis. As Inigo Montoya said to the Man In Black in *The Princess Bride*'s brilliant swordfighting scene, I know something you don't know. Don't worry; it has nothing to do with being left-handed. The thing I didn't mention previously and which may augment our analysis of the first story is this: I was actually managing *two* contracts at the time.

The Rest of the Story

While no two contracts are identical, the two I managed were remarkably alike. Both were with the same type of contractor, both were supported by contracting professionals from the same organization (external to mine), both were active in the same timeframe, and both had the same program manager—me. But unlike the infamous contract in my previous article—let's call it Contract A—the other had zero contracting-related problems. That's right, none, nada, zilch.

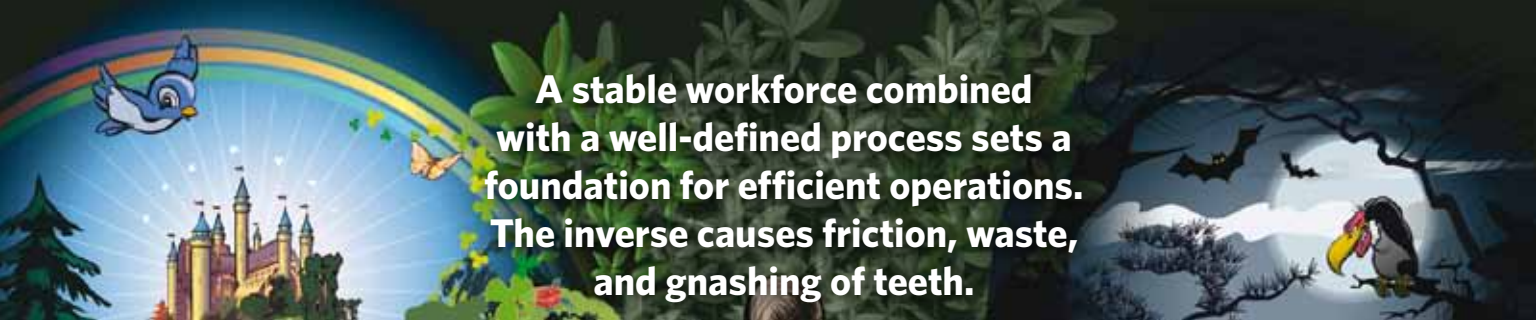
I wouldn't believe it myself if I hadn't seen it with my own eyes, but we completely avoided the Just One More Thing syndrome that was so prevalent on Contract A. We had no rework, no significant delays. What could possibly account for the divergent outcomes? Well, for all the similarities between A and B, there were two major differences.

First, Contract B had no personnel turnover. The contract specialist I worked with on day 1 (let's call him Chip) was still there when I left that job almost 2 years later. Compare that to the downright comical level of personnel turnover on Contract A. I think this fact alone accounts for much of the difference in outcome. However, the contracting officers (COs) weren't formally part of my organization, and I had precious little influence on their comings and goings. Further, I'm told the current deployment tempo for COs means personnel stability is out of *anyone's* hands, so that may not be a particularly imitable lesson.

Hold on. Can we really accept the assertion that there's nothing we can do? Let me suggest we can always do something. Maybe we can't prevent turnover entirely, but surely we can take steps to reduce it. Further, one might wonder how Chip managed to keep working on Contract B for so long. His steady presence is an uncomfortable counterpoint to those who assert turnover is unavoidable.

Chip might be a one-in-a-million exception, but maybe there's a more rational explanation. Maybe something about his work environment made Chip want to stick around instead of running off to join the circus or the French Foreign Legion. Rather than dumb luck, I'm convinced Chip's presence points to his organization's leadership doing something right in a big way. That's important. In an environment where churn is the default, islands of stability aren't accidental. They're the result of someone doing something good.

Unfortunately, space constraints prevent me from fully exploring the hows and wherefores of good personnel management. For now, let me just make two assertions: a) Stability makes a difference, and b) There's something we can do about it. To explore the issue in more depth, download an excellent free report by Carnegie Mellon's Software Engineering Institute,



titled *Success In Acquisition*. Mr. Google can show you where. The section you're looking for starts on page 49.

The Other Difference

I mentioned there were two major differences between the contracts, and now we've come to the second one. Early on, Chip and I sat down and wrote out a detailed process flow, documenting all the steps of all the activities we would undertake for Contract B in the following year. Together, we explicitly stated what I would need from him and what he would need from me. We created a stack of templates (work statements, cost estimates, performance plans, etc.) and agreed on both the content and the format. We then used those templates every time we added a new task order, exercised an option, provided incremental funding or took other contracting actions. It worked flawlessly. If Chip had been replaced at some point, the process and templates we'd established would have given us a fighting chance of minimizing disruption.

As "My Big Slow Fail" showed, I tried multiple times to make similar arrangements on Contract A. Unfortunately, these efforts were met with responses ranging from disinterest to amusement to apathy, depending on which contracting officer was in place at the time. One CO explained with a straight face that each individual has their own personal preferences as to format and content and thus the forms I used on Contract B were not acceptable on Contract A. Once or twice I got close to what we had on Contract B, only to have the rug pulled out from under me as new people came on board or new processes were added.

Stand Back: I'm Going to Try Science

In retrospect, this is as close to a scientific contracting experiment as one guy can do. Without intending to, we'd controlled most of the variables and radically changed two: personnel stability and process. The scientific method tells us divergent outcomes are likely to be caused by *differences* in the initial conditions rather than any of the common elements. So at the risk of turning this story into an after school special, I'd like to suggest that stabilizing the workforce and instituting standard processes are pretty good ideas.

This was not a perfectly rigorous experiment. In all fairness, Contract B was a bit smaller and simpler than Contract A. It didn't involve awarding a new contract, so we did not have to perform all the same activities that were required on Contract A. No doubt the difference in size and scale account for some of the difference in outcome. However, Contract B was busy enough. We had forms, reviews, and various contracting actions. There were plenty of opportunities for things to go badly. They *never* did. Because it's so much fun to write it, let me repeat: We had no significant delays, zero contracting related problems, and zero rework on Contract B.

I am pretty sure stability plus standards were the main secrets of our success, but let me be the first (and probably not the last) to say I could be wrong. Maybe I'm an idiot after all. If I'd been better at my job, perhaps I could have either established common processes on Contract A or prevailed despite their absence. I won't rule that out. But if that's what happened, my inbox tells me I've got a whole lot of company.

Or maybe Chip is hyper-competent and therefore fully responsible for the completely positive outcome on Contract B. I won't argue with anyone who wants to praise Chip's performance. On more than one occasion, I let his supervisor know I think Chip is a fantastic contract specialist. He undoubtedly deserves buckets of credit for how things went on Contract B. I was thrilled when, shortly before I moved to a new job, he was assigned to work on Contract A as well. I only regret I couldn't take him with me to work on all my future contracts.

A Few Final Remarks

As I said in the previous article, if you reduce a story to a point, you'll miss the story. I still think that's true, and I still believe stories are more valuable than points. Accordingly, I want to once again invite readers to draw their own conclusions. At the same time, I hope it's not out of bounds for me to offer some closing comments.

As an engineer, I'm trained to follow the data and look for solutions. The more I reflect back on these two contracts, the more compelling the data seem, particularly when analyzed in conjunction with the detailed, sometimes gut-wrenching stories I received from readers across the DoD. All indicators point to the idea that a stable workforce combined with a well-defined process sets a foundation for efficient operations. The inverse causes friction, waste, and gnashing of teeth. This isn't a particularly profound or original discovery. In fact, it's very much in line with the Lean philosophy, which has a more impressive pedigree than one guy's perspective.

People much smarter than I am tell me my story is a textbook example of the problems Lean is designed to solve—problems that are common across government and industry. And Dr. Atul Gawande's brilliant new book *The Checklist Manifesto* offers further corroboration of the impact a simple checklist can have. So when I talk about following the data, I'm

looking at a much larger collection than just Contract A and Contract B.

But I'm not just an engineer. I'm also a writer. As a writer, I put words on paper and strive to tell honest stories, whether they're flattering or not. Some people disagreed with my decision to air dirty laundry, and I understand their concern. However, when it comes to dirty laundry I believe it's better to air it than to wear it. Yes, it's a shame things like "My Big Slow Fail" happen. But it's a bigger shame if we pretend this sort of thing never happens. I sincerely hope that by telling this story in a public setting we can come together and work to solve an all-too-common problem.

Although I followed the data like an engineer and put words on paper like a writer, telling this story was primarily an expression of my role as a military officer—a leader. As a leader, I can't deny or dismiss the problems I see. As a leader, I have an obligation to speak up and step up. It's only when we openly acknowledge and discuss our shortcomings that we have any hope of overcoming them.

The story I told could happen anywhere. Based on the feedback I got, it does happen almost everywhere. That means it's not just my story; it's the story of countless teams across the Department of Defense. These problems are neither unique nor rare. I won't say they're ubiquitous; there are plenty of Chips out there, working hard to deliver impressive results like Contract B. But Contract A's story is common enough to be troubling. As a leader, I have a responsibility to do something about that.

Learning to See

One of the key steps in the Lean approach is learning to see. Since nobody can be everywhere and see everything, it is sometimes useful to borrow someone else's eyes. One way to do that is by reading someone else's story. In the reading, we may discover it's our story too. Reading our story expands and sharpens our vision, illuminating things that were previously in shadow and bringing into focus things that were previously obscured.

It turns out the act of telling a story can be just as illuminating for the teller as the hearer. Writing "My Big Slow Fail" helped me see, understand and learn from my own experience. Publishing it was an attempt to share that sight, lending my eyes to a wider community. The broad response it triggered opened my eyes even further, and I'm deeply appreciative of every single person who took the time to write.

I hope this follow-up piece sheds a little more light and helps continue the conversation in a productive direction. I hope it points to solutions that are within our grasp and encourages people to take action. If nothing else, I hope it shows that while the acquisition community faces significant challenges, we don't face them alone.

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Are You Trusted by Your Employees?

Wayne Turk

The 12 points of the Boy Scout Law are: "A Scout is trustworthy, loyal, helpful, friendly, courteous, kind, obedient, cheerful, thrifty, brave, clean, and reverent." I wrote that from memory more than 50 years after learning it. I am not saying that to pat myself on the back, but to emphasize how important it was. It made a big impression

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on me, particularly the first point of the Scout Law—trustworthy. Trustworthiness, I reasoned, must be pretty important.

We all know what "trust" is, but I looked it up in the dictionary anyway. I wanted to see what words were used. While over a dozen different definitions appeared in the dictionary I referenced, only three applied directly to the kind of trust that this article is about:

- Reliance on the integrity, strength, ability, surety, etc., of a person or thing
- Confident expectation of something
- A person on whom one relies

In an organization, trust needs to be a multidirectional street—people need to trust the organization, their manager, their peers, and anyone they may supervise. A lack of trust anywhere can damage morale, productivity, and efficiency.

Why is Trust Important?

When employees trust and respect their manager, they will give more effort, especially when they feel trusted and supported in return. Employees don't usually give their best effort working for someone they don't trust, who they believe doesn't trust them. Without trust, productivity suffers as employees play politics, spend time covering themselves, passively follow policies that may not be best, and never speak up with suggestions for improvement. Lack of trust affects morale and customer satisfaction. Employees' main focus becomes resentment and dissatisfaction toward management.

Little or no trust in an organization is a situation that is readily apparent. According to Robert B. Rogers and Sheryl Riddle, president and senior vice president for DDI Consulting

Services, the following are warning signs that a trust issue exists in an organization:

- An active, inaccurate grapevine
- Elaborate approval processes
- Low initiative
- High turnover
- A high fear factor among employees
- Turf wars
- Defensiveness

If these signs are obvious in your organization, you need to do something about it. You may not be able to change the complete culture of the organization, but you can at least start with your area. Then maybe it will spread. And if you are the head of the organization (or department or project), you can make an impact.

Building Trust

Trust is easy to destroy and very hard to rebuild, but not necessarily all that hard to build in the first place. It does take time, though. Listed here are a few suggestions for building trust. They are just common sense and are taken from various sources, including personal experience. They are not only valid in the work environment, but in your personal life as well. Being a trustworthy person helps you be a trustworthy manager.

Trust is built over time; one action, thought, or decision won't do it. It requires a consistent set of attitudes and actions. You have to continually show that you are worthy of the trust of those around you. Each time that you do something "right" is a step toward winning trust. With some of those around you, it may be a long journey.

Find ways to be regularly available to your employees. Be responsive; unresponsiveness causes unease and distrust. Be action- rather than talk-oriented. Be willing to talk to them. It also gives you the chance to learn about them as individuals.

Your workers need to be able to express concerns, identify problems, share sensitive information, and raise relevant issues. It is important to set the ground rules as to how you will handle information brought to you in confidence. Sometimes this will be exceedingly difficult.

Take the time to put yourself in the other person's shoes. Consider how you would react or what you would think if you were that other person in this situation. Having empathy for others is a good start.

Ask for feedback. Make it clear that respectful feedback is welcome, even if you don't agree with it. Make your attitude one of "It is important that I know what you think, whether I agree with you or not." Truly listen to the feedback that you get. Don't get defensive or emotional.

Share information regularly. Let people in on the data you get as a manager whenever possible. Managers who communicate openly and frequently can build solid relationships and trust with their employees. Don't make them guess what you know or what you are thinking. Tell them. Employees sense that no news is bad news and that you are hiding something from them. A lack of interaction can erode trust. Face-to-face communication is the best method to build trust.

Sometimes you will have to pass on orders or implement a policy that will be unpopular. Don't shirk responsibility for what you are doing, even if it wasn't your decision. Don't just blame it on upper management or the chain of command. Let them know why the policy or decision was made. If you have to decide on an action that will be unpopular, it may help to bring your employees in on the decision-making process. Get their input. Show them that they have a say, but remember that you will still have to make the decision.

Don't hide or lie about bad news. Chances are the truth will come out eventually. If you hide the bad news and it does come out, you have lost your credibility and their trust. Sometimes a response of "I don't know," "I hope not," or "I'll tell you as soon as I can" is acceptable. If you can't answer a question, just say so. Tell them that you can't say anything, but that you will as soon as you can—and do it. The same goes if you don't know the answer. Just tell them that you don't know. However, don't say that you will find out and get back to them if you know that you can't.

It is important for a manager to create an environment of trust. This begins by trusting others. Assume employees are trustworthy unless they prove otherwise rather than waiting to give trust when they have earned it. If your employees feel that they are trusted, they will find it easier to trust in return.

Keep your word or explain why you can't. Do what you say you will do and make your actions visible. People quickly pick up on insincerity and don't like broken promises. Keeping commitments will foster trust. Whenever you don't or can't meet a commitment, be up front about it. When you point out and explain your own lapses or potential roadblocks, it engenders trust in your honesty. Of course, if your failure to follow through for whatever reason happens frequently, you are just seen as incompetent, insincere, or untrustworthy. Then you lose their respect and trust.

Trust also results from consistent and predictable actions and decisions. If you respond differently from week to week, it becomes harder to win trust. If you take action on a whim or your decisions are inconsistent, you will be seen as untrustworthy. Consistency in your treatment of others is a part of earning trust, too.

Don't talk about people behind their backs. If you can't say it to a person's face, don't say it at all. If another manager asks what you think about one of your employees, be honest; however, nothing should be said that you haven't told or wouldn't tell the person in a feedback or appraisal session.

Hold yourself and others accountable. If someone is promising results and delivering nothing, call them on it. No matter how trustworthy you are as a person, if you don't manage your people well, they'll lose trust in your management ability.

Don't hog the glory or take credit that isn't due. If you take an idea or suggestion from one of your people up the chain and it is accepted, give the proper credit. When your team or department meets their goals, share the credit.

When it comes to trust and respect, these qualities are earned, not demanded. So don't demand trust. Just keep working away to earn it. You can't create it directly; it comes when the conditions are right. When they aren't right, it simply won't happen. So focus on creating an environment where trust can grow. It won't happen overnight—it may take months rather than days, but it is definitely worth having.

Trust is built over time; one action, thought, or decision won't do it.

Destroying Trust

Trust will start to crumble when people perceive that you are not "**walking your talk."** Sometimes these perceptions reflect reality, and sometimes they don't. Sometimes the issue is less you than it is the whole organization's culture, and in those cases you may have an even tougher hill to climb. Trust can be destroyed in a number of ways—and you want to stay away from all of them.

Listed here are some of the common actions that cause loss of trust or prevent it from developing. These are basically the converse of how to build trust:

- Not trusting your employees.
- Lying to your employees. As mentioned earlier, the truth usually comes out and your creditability is shot.
- Holding back information—good or bad, but especially bad. When employees find out that you knew and didn't tell them, trust takes a hit.
- Not following through on commitments or promises.
- Having a focus on what employees do wrong, putting people down, belittling them, and making them feel unworthy.
- Not showing respect toward your employees.
- Yelling at employees and making public humiliation a weapon. People will start avoiding contact with you.
- Trying to use fear as a management tool. Saying things such as, "Don't do this, or you're fired" or "Do that, or you're fired." It may work, but only for a short while, and it destroys trust.
- Not being accountable yourself, but expecting accountability from your employees.
- Not recognizing achievements or rewarding a job well done.
- Showing favoritism or not treating people fairly.
- Not being ethical.
- Taking credit for the ideas or work of others.
- Never admitting that you made a mistake. Not apologizing when you do.

As you can see, issues of trust can easily result in problems. It must be so, because a recent survey of employees in the United States shows that "Only about half [49 percent] of employees said they have trust and confidence in the job senior managers are doing." That is not a very good showing.

Conclusions

It all boils down to common sense. There are no special gimmicks, silver bullets, or other simple solutions. You can't create trust with high pay, great company picnics, or wonderful working conditions. It is generated through teamwork, honesty, and fairness.

It is hard to show a direct proportional relationship between trust and productivity because trust is an intangible. But I and many others in the management field believe that the direct relationship exists. Where there is trust, high morale and productivity result. That is what you want in your organization.

You could say that the trust of the employees toward the manager is really just a byproduct of good management practices. Almost everything discussed in this article as a way to build (or destroy) trust is a good (or bad) management practice.

Of course many of the attitudes and actions described spill over into your personal life, too. You not only want trust and respect at work—you want it in all facets of your life. So follow the guidelines (with sincerity) and you should find it.

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Managing, Leading, and Bossing

Stan Emelander

Leaders fascinate us. From the smallest shop to the largest corporations, employees observe, speculate on, and talk about their chiefs; if you are ever at a loss for a conversation starter, "Tell me about your boss" will work. Another great question is, "What's the difference between a leader and a manager?"

Early in my career, I thought there was no significant difference between managers and leaders and that talking about distinctions between the two was a waste of time, just an exercise in semantics. Now I am convinced of the opposite; although the positions do overlap, there is a real difference between the roles of manager and leader, and the distinction is important. In fact, those in a position of responsibility who do not understand the differences between managers, leaders, and a third category, bosses, are likely to be mistaken about their own role and the effect they have on others.

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Managers

Not long ago, a friend told me, "Managers manage things; leaders lead people." That's a good starting point, but I like a slightly different emphasis: Managers are concerned with performance to standard. The things being managed can be either processes or persons, but the emphasis is on meeting an established level of performance and delivering expected results. In the process of achieving goals, managers communicate standards, secure resources, and remove constraints affecting their people. Managers are generalists who often work in dynamic environments, weighing and integrating diverse variables in pursuit of established objectives. To perform effectively, managers often draw upon advanced technical knowledge and/or considerable general insights into how things and people work.

The broad knowledge base of managers can itself be considered a specialized technical skill set. The project management discipline is a strong example of this idea. Professional project managers are expected to be technically skilled in a wide-ranging set of competencies including scheduling, resource management, communications, and risk management. The ability to be aware of and balance these considerations is a technical skill itself and distinguishes project management as a distinct discipline.

Leaders

I have a progressive, positivist view of leaders, based on the transformational leadership model. Leaders are those who enable followers to exceed expectations and who implement change in organizations. Whereas managers work within the bounds of expectations, leaders inspire and empower workers to establish goals that exceed what they were capable of on their own. Leaders also reinforce workers' sense of competence and intrinsic motivation, enabling new growth. The ability to envision new potentials and bring them into being is less common than the skills of efficiency and effectiveness in achieving established goals. This explains why strong leaders seem to be rarer than competent managers.

Notice the emphasis on followers. Leaders are change agents, and although they can develop a vision of what the organization needs to become, followers hold the power to make the vision a reality. As the saying goes, "A leader without followers is just a guy out for a walk." Lasting, effective change occurs in organizations when followers willingly implement it. In my view, true leaders are a benefit to their followers, and one may include the virtues of empathy and respect for others among leadership character traits. These are also skills associated with effective change management, and change is the core purpose of leadership.

While the distinct goals of managing and leading merit recognition, in practice the roles may overlap. Because managers need to be effective communicators and be trustworthy, they often act in a very leader-like manner. By securing resources, removing obstacles, and providing timely and accurate feedback, managers may empower workers to exceed expectations like a leader. Leaders, similar to managers, enhance their credibility by being technically knowledgeable of the tactics and techniques of their followers. Effective leaders may be technical experts in their own areas of specialization, fields such as change management, innovation, and strategy formulation. Effective management and leadership may blend in many supervisory positions when those in charge need to apply standard methods to achieve new objectives. Bosses, however, have different agendas and methods than true managers and leaders.

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Bosses

Every organization includes supervisors who lack general or technical skills, or who neither inspire nor benefit the people under their control. A good manager knows how to effectively work with the human resources within their span of supervision. A great leader moves the organization forward to new capabilities by enabling and enhancing workers. I label the people who do neither of these bosses. In contrast to helping the organization by supporting workers, bosses concentrate on their image, power, and future gains. Narcissism is a trait common to these anti-leaders.

One broadly recognized leadership type is the narcissistic leader. As you could guess, the narcissistic leader is concerned foremost about themselves. They are argumentative, competitive, and fundamentally insecure about their own capabilities and relationships. Work environments that include a narcissistic boss are unstable because the supervisor micromanages and competes with others, including his/her followers. Narcissistic personality types have difficulty considering the perspective and feelings of others, contributing to low workplace motivation and morale. Most tragically, narcissistic leaders are often willing to exploit followers as means to a personal end. While there are some narcissistic leaders who

have exceptional charisma and vision, they are very rare. The rest are a variety of boss.

The problems with bosses are that they often don't know what they are doing, and they cause harm. Micromanagement fritters away the resources workers need to achieve standards and wears people down. Bosses may have forceful personalities and a practiced knack for ordering people around, but if they cannot lead beyond business-as-usual goals or build up people's capabilities, they have missed the big picture of leadership. As managers or as leaders, they do not know how to handle the firm's most important resource: people. One of the common costs associated with boss-type behavior is employee turnover. As another saying goes, "People don't leave jobs; they leave managers."

Another weakness of bosses is a lack of self-awareness. Self-awareness and monitoring are attributes of managers and leaders who grow throughout their careers, and realistic self-assessment is antithetical to a narcissistic perspective. The drive to improve includes the capacity for honest self-evaluation and the motivation to seek answers leading to higher levels of personal and organizational performance. Growing managers/leaders extend the need to realistically assess capabilities and performance to include themselves, including their own assumptions and views. Those attributes are missing in bosses. A supervisor with a natural talent for getting things done, but who is self satisfied and complacent in their role may be headed towards being a boss.

Recommendations for Avoiding the Boss Syndrome

Over and over, the difference between mediocre and excellent performance is shown to be the extra effort to go beyond low expectations and the easiest way of doing things. When implementing organizational change, for instance, the easiest way to start is by fiat from the top. That is also the most failure-prone method. It takes real effort to frame the reasons for change in a way that can be articulated to workers, communicate those reasons, and receive feedback. To do these things, a leader does not have to be smarter, more charming, or better-looking but does need the courage to ignore the inner voice that says, "Just tell them to do it; it's what they're getting paid for."

Likewise, the easiest way to manage is to repeat what you have experienced coming up through the ranks, probably including some bad habits. Both managers and leaders fall short of their potential when they rely on "common knowledge," old-school approaches for working with followers. Yet the temptation to rest on old routines is hard to resist. Here are two approaches for fighting stale habits.

Reflective Learning

One of the hardest yet most valuable activities managers can pursue is reflective learning. This kind of learning occurs when one considers the experiences of the recent past, analyzes the methods used, and reflects on the outcomes. The benefits of self-reflection include improved performance and re-validation of goals. Reflective learning is akin to the triple-loop learning process. The process includes learning something new or developing a plan (single loop), reflecting on what you've learned and whether your assumptions are valid (double loop) and analyzing how well you are doing (triple loop).

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Evidence-Based Management

EBM is a powerful theme for decision making. As its name implies, it emphasizes fact over opinion. Supervisors who integrate an EBM perspective into their thinking are not satisfied with opinion and anecdote as the basis for decision making. Instead, they push themselves and their followers to discover what expert-, research-, and fact-based evidence is available to support important decision and processes. Information on hiring, leadership, training, rewards, and burnout is readily available from the Internet, libraries, and consultants. Reliance on facts de-emphasizes feelings and ego involvement in decision making, keeping that narcissist in all of us under control.

Although this article focused on benefits to followers and organizations from effective leadership and management, the supervisors gain much as well. In addition to professional success, deep satisfaction is an outcome associated with an orientation towards helping others and achieving goals linked to core values. The status-driven motivation of narcissistic leadership, on the other hand, is linked to loss of fulfillment. The efforts involved in focusing outside oneself are greater, but the rewards are as well.

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Let us know what you think!

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Defense AT&L

Writer's Guidelines in Brief

Purpose

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

Submission Procedures

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

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

Deadlines

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

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

Audience

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

Style

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

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

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

Length

Articles should be 1,500–2,500 words.

Format

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

Graphics

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

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

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Author Information

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

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