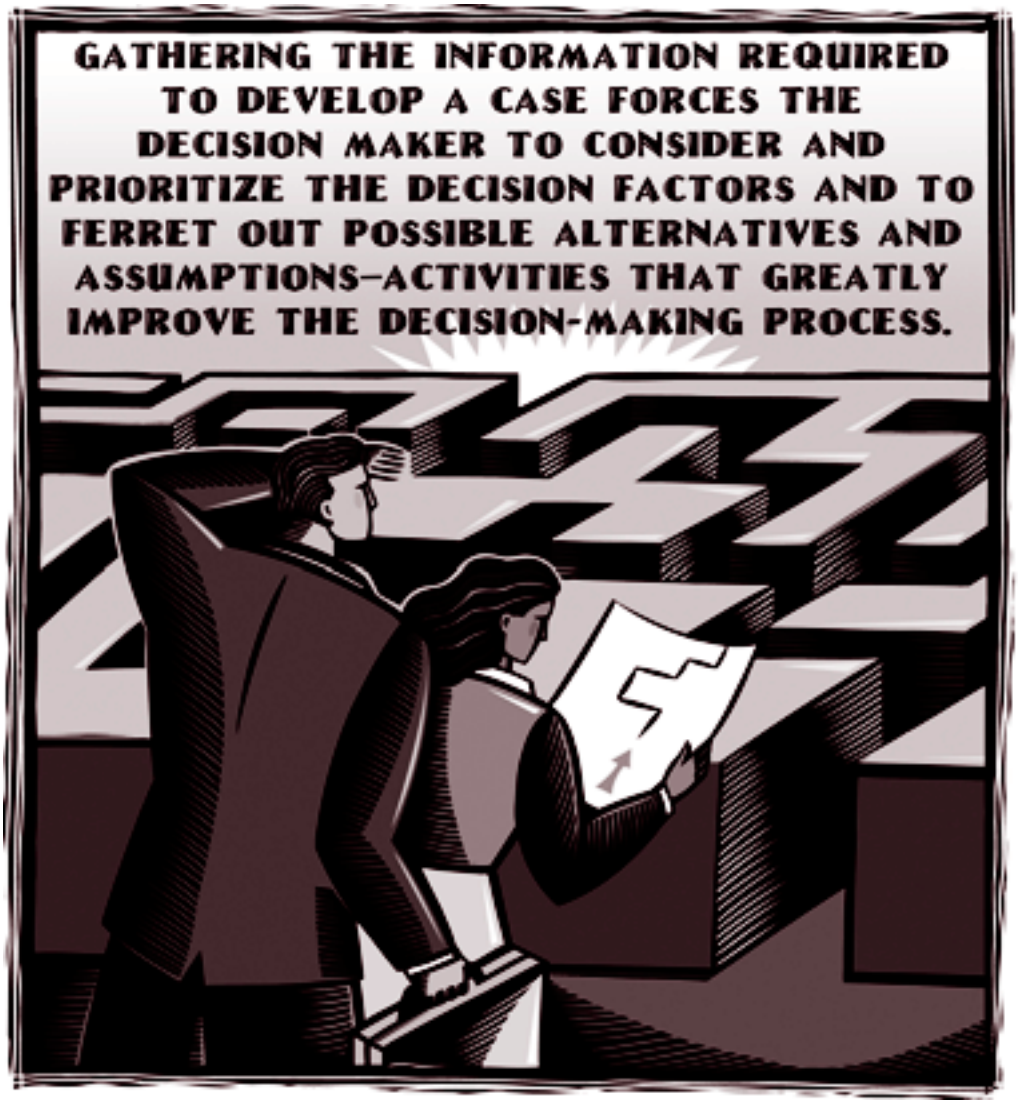
Optimizing the Supply Process at the Defense Logistics Agency

A Case Study

John F. Horn



On April 14, 2000, Jerry McMahon, a Defense Logistics Agency (DLA) weapon system support manager (WSSM) at the Defense Supply Center in Columbus, Ohio, was reviewing March 2000 supply support metrics for the U.S. Army's Mustang scout vehicle. The average turnaround time for purchases of consumable spares had remained at 320 days, showing that his recent efforts to improve response time hadn't worked. In addition, the fully mission-capable operational readiness of the fleet was at 88 percent (below the critical 90 percent secretary of the Army reporting level) and a recent Army audit had spotlighted consumable spares as a significant contributor to the problem. McMahon decided that the current supply support process at the DLA Defense Supply Center was broken and the relationship with a primary defense contractor needed improvement. But what was the best approach to fix the problems? [*Editor's note: The identities of the program and the players have been changed.*]

The History of DLA

In 1952, a joint Army, Navy, and Air Force organization was formed to control the management of supply items. This marked the first time the military services bought, stored, and issued items using a common, cross-Service nomenclature. By 1961, it was apparent that additional benefits could be gained by this consolidation. Secretary of Defense Robert McNamara ordered the consolidation of the three Service agencies into a single entity and established the Defense Supply Agency (renamed

Horn *is the course manager for DAU's Program Management Course. He has written over 20 cases and teaches case studies in various U.S. and European acquisition courses.*

the Defense Logistics Agency in 1977). In 1986, the Goldwater-Nichols Act established DLA as a combat support agency. Today the supply chain support mission extends worldwide. DLA manages consumable spares for the military services' 1,400 weapon system end-items, food and subsistence for troop sustainment, medical supplies, and bulk fuel and petroleum. In 1997, DLA adopted a more weapon system-centric support posture.

Team Mustang Partnership Forms

During September 1999, the U.S. Army Tank-Automotive and Armaments Command (TACOM) awarded a 13-month, $49.7 million base service contract with four one-year options to Zemora-Tudis Motors (ZTM). ZTM would provide logistics support for the Mustang scout vehicle. This contract, known as the Team Mustang Partnership (TMP), enabled TACOM to provide support of unique reparable electronic components and provided the potential to realize improved readiness rates. The benefits to be gained included reduced cycle times and associated reduction in pipeline/costs, no upfront customer funding requirement with 15 percent surcharge reduction, a standard retail supply system transparent to the soldier, and direct vendor delivery.

The Defense Supply Center, Columbus Land Group manages the consumables supply chain for approximately 600 land-based weapon systems. McMahon, as the Mustang WSSM, was responsible for ensuring that supply support issues didn't degrade the readiness of the Mustang weapon systems. He was the direct link to the Mustang program manager (PM). McMahon's responsibilities were to:

- Gather, analyze, and interpret Service and DLA readiness data; develop key issues and detailed action plans as necessary
- Maintain weapon and troop support system readiness metrics (external and internal)
- Recommend appropriate investment and acquisition strategies that enhance support of weapon and troop support systems
- Understand and disseminate weapon system configuration, technical, and safety issues impacting DLA support requirements
- Provide input to DLA Weapon System Support Branch on potential Service contractor logistic support initiatives that might impact any weapon and troop support systems
- Represent assigned PM/system program office (SPO)/industrial activity-type customers in resolving fleet-wide, program-impacting, critical national stock number (NSN) issues that diminish the readiness of an assigned weapon system [*NSN is the number assigned to a specific part by DLA for identification purposes*]
- Coordinate with other DLA supply centers to resolve multiple supply chain support issues.

McMahon's Dilemma

WSSMs used metrics to track the support posture of weapon systems. The metrics included system readiness, weapon system special purchase requests (SPRs), DLA-delayed parts readiness drivers, backorders, and supply materiel availability (SMA) for common and unique stocked NSNs. McMahon's quarterly report on March 15, 2000, showed a fully mission-capable (FMC) rate of 88 percent. He knew any FMC rate below 90 percent would require a "get well" action plan.

The supply problems had started two years earlier when the lead time to administer and award purchase requests began to creep upward. The turnaround time (time from receipt of requisition to delivery of goods to customer) for unique consumable spares purchase requests rose to 320 days, and efforts to improve that response time appeared ineffective. The purchase requests were being generated manually and forwarded to ZTM, the prime contractor and sole source for the Mustang system. The ZTM response (quote) would arrive on average 120 days later by mail or fax. The delivery time averaged 200 days.

After careful analysis, McMahon discovered that the primary reason for the long response time was ZTM's spares support production mentality. While the Mustang was in production, spares were not a significant portion of ZTM's business base, as they had few resources devoted to spare part delivery. When DLA couldn't get timely quotes from ZTM, they went directly to subcontractors or vendors to purchase the parts. This was becoming less of an option, as many of the vendors were going out of business or no longer producing the item. The customer wait time is illustrated in the graphic on page 13.

Desperate to maintain FMC levels, the maintainers in the field resorted to using their IMPAC (international merchant purchase authorization card) credit cards to purchase parts from any source. This workaround provided functional replacement parts, but it did not guarantee "certified" parts that were equivalent to NSN standards. Also, the Service lost the economic ordering quantity and configuration control advantages of the DLA system.

Reengineering DLA Business Processes

McMahon knew he was facing a problem during a unique period in the history of DLA. DLA was moving away from the old methods of buying, stocking, and issuing materiel. In the past, products purchased were made to strict military specifications and bought one at a time as the need arose. DLA adopted an initiative to reengineer its business practices to provide products to its customers better, faster, and cheaper. A simple philosophy emerged: capture and adapt current best-value commercial business practices and further enhance them by applying the latest emerging technologies. DLA advocated long-term partnerships with industry, direct vendor deliveries to cus-

tomers from commercial distribution systems, on-demand manufacturing arrangements, and electronic commerce. DLA was moving from a supply-based system relying on large stockpiles to a Web-enabled distribution system that exploited advances in commercial information systems to gain total asset visibility and to improve management of the entire supply chain. DLA's focus was shifting from managing inventories to managing information across the supply chain; from managing supplies to managing suppliers; and from buying inventory to buying response. Much of the impetus for DLA's process reengineering resulted from emerging technologies and acquisition reform initiatives—but DLA was also facing the reality that while its mission was increasing, it would experience a 68 percent reduction in manpower by fiscal year 2005 from the peak of 65,000 personnel in fiscal 1992.

McMahon's Objectives

McMahon's broad objectives were to:

- Optimize the Mustang supply process to minimize customer wait time (CWT)
- Build customer confidence in time-definite delivery
- Maintain total asset visibility with information technology
- Use Web-based systems
- Realize cost savings.

There was one additional concern McMahon wanted to address in his solution. The war in the Persian Gulf showed that the Mustang could experience an operating tempo 10 to 40 times the normal operating rate. In the past, DLA inventories had played a large role in meeting surge and sustainment (S&S) requirements. Any new methods he implemented must include a solution to satisfy S&S requirements.

Three Possible Solutions to McMahon's Dilemma

Three DAU professors, Chris Roman, Stephanie Possehl, and Jim Carter, present possible solutions for McMahon based on their assessment of the issues, their decision criteria, the solution, and how they would measure success.

Chris Roman

McMahon is doing everything he's supposed to do. He's monitoring requisitions, compiling metrics, and analyzing problems. What he can't seem to do is effect change. ZTM places a relatively low priority on consumable spares. As a company, their duty is to their bottom line, and consumable spares probably contribute little to it. The consumable spares (things like oil filters and windshield wipers) are manufactured by a host of subcontractors, and ZTM is essentially a conduit between the subcontractors and the Mustang fleet. ZTM probably marks up the price of the consumables to cover their overhead but otherwise reaps little profit.

It's hard for McMahon to effect change if the right incentives are not in place. Until ZTM feels a compelling reason to accelerate delivery of consumable spares, they won't.

The larger dilemma that McMahon faces is how to bring the Mustang consumables into the information age. Requisitions are still a manual process, subject to errors and delays. The business process that he oversees is an anachronism. Fortune 500 companies have long since modernized their supply chain management, creating seamless electronic value chains from the lowest tier suppliers of raw materials to finished customer products. In an era of rapid business process reengineering, ZTM and McMahon have remained stuck in paperwork.

Issues

First, McMahon must reduce lead time for consumables for Mustang. Readiness levels will not rise until lead time is shortened. Second, he must consider how to reengineer the Mustang supply chains to reflect the DLA21 initiative. The current paper-intensive process does not exploit modern information technology.

Decision Criteria

When McMahon is assessing his choices, he must consider three principal criteria: How much will the option cost? How long will it take to implement? How much will it reduce CWT?

Probably more important than the above criteria is the generation of options. Very often, decision makers fail to see the full spectrum of possible solutions, and analyzing criteria for the wrong solution set is not fruitful. One possibility has already been surfaced by ZTM itself—disintermediation. DLA should bypass ZTM and purchase directly from the manufacturers. ZTM delays the process and provides no value added. They have been hinting for some time that DLA should bypass them.

Proposed Solution

One short-term solution is to rewrite the supply contract with ZTM and transfer management of the consumable supply process to one of ZTM's subsidiaries, perhaps Zemora-Tudis Services Company (ZTSC), which is demonstrably more competent in supply chain management. The new contract should reward early delivery and penalize lateness. If ZTSC has an opportunity to make substantial profit by getting consumables to the field in six hours (as they do for reparable parts) instead of 320 days, they'll do it. How ZTSC accomplishes the CWT reduction should be left to them. They may choose to accumulate a standing inventory of consumable spares (at least for the immediate future).

Average Mustang Customer Wait Time

Action	Days
1. Customer transmits requisition to DLA	10
2. DLA processes requisition, determines out-of-stock condition, submits request for quotation to ZTM	10
3. ZTM processes request and submits no-quotation (or 200-day delivery)	120
4. DLA submits alternative request for quotation to potential vendor(s)	15
5. Vendor(s) process quote and submit to DLA	20
6. DLA processes quote(s) and places order	20
7. Vendor delivers product to DLA supply center	120
8. DLA processes requisition and ships supply to customer	5
Total elapsed days	**320**

Longer term, a modern system for placing orders electronically with the original manufacturers must be implemented at DLA. For this, McMahon needs to work within the overarching DLA21 initiative, which will involve implementing DLA-wide supply chain management systems.

Measures of Success

It's tempting to say that meeting readiness level is the measure of success, but McMahon has limited control of the readiness metric. The CWT for consumables is believed to be a factor in fleet readiness, and while it is one of many factors, it's the only one McMahon can control. So success should be measured by reduction in CWT. It is important to set a "stretch goal." Reducing the CWT from 320 days to 120 days is an improvement, but it is much too modest. The CWT goal should be based on benchmarks from industry where supplies are delivered in hours or a few days. The fact that ZTSC is delivering reparable parts in six hours suggests that the same can be accomplished for consumables.

Stephanie Possehl

There are no easy answers for McMahon. He's faced with poor operational readiness levels for the Mustang, a less than stellar relationship with the sole source prime contractor, and organizational changes within DLA. Additionally, shrinking defense budgets and acquisition reform initiatives are spurring him to make the supply support process significantly more efficient. There are many approaches to choose from, among them developing a partnership such as TMP, increasing DLA's inventory levels, working with the contractor to improve the existing process, choosing a different contract type, and so on. McMahon's previous approaches have failed, so he's going to have to take drastic steps.

Issues

The 88 percent fully mission-capable operational readiness level is McMahon's most immediate issue. The 320-day average turnaround time for purchase requests must be resolved. Underlying issues include the low priority given to spares support by ZTM and the fact that subcontractors and vendors have been going out of business with little advance warning. Field units' use of credit cards to purchase unqualified parts to keep their readiness levels up has led to both configuration and reliability problems that, in turn, contribute to the low readiness levels. McMahon must break the Catch-22 cycle. The question is, how?

Decision Criteria

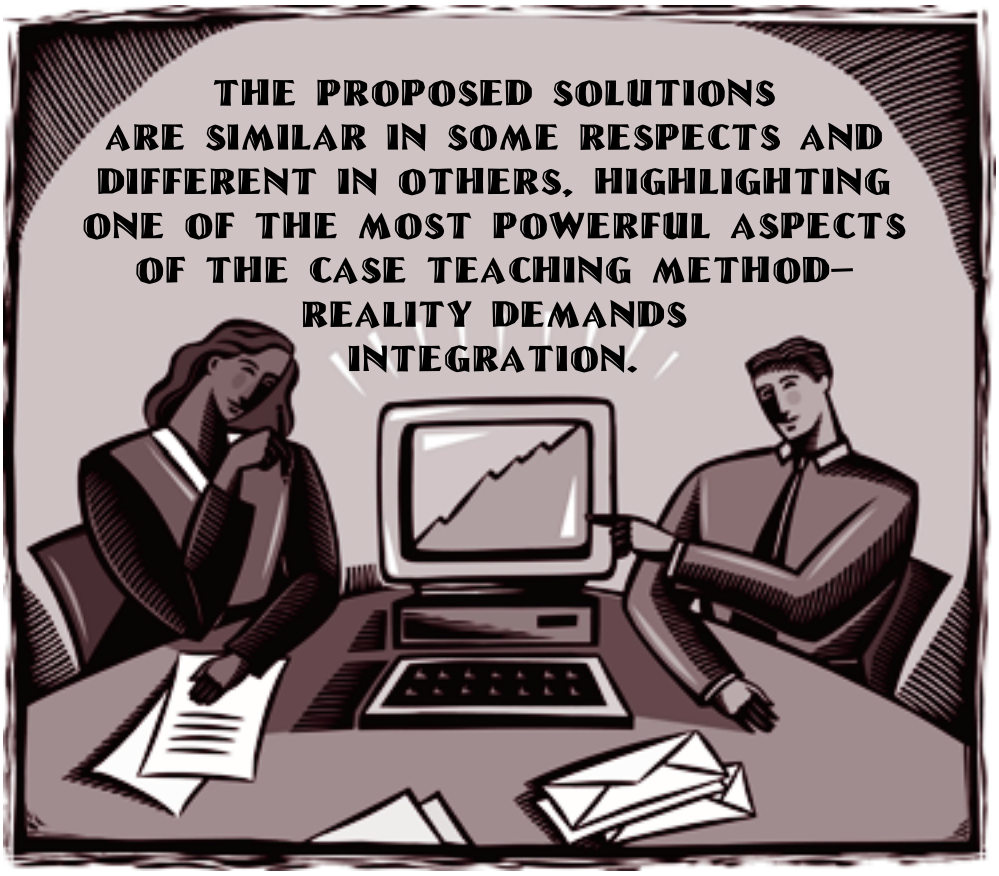
Overall process improvements are necessary to bring about the following: significantly improved turnaround time; only qualified parts in the field; the ability to meet S&S requirements; and an improved government/contractor relationship. The proposed solution is a long-term fix and will not realize immediate improvements in readiness levels. Some up-front investment is required to develop the predictive parts model, the obsolescence database, and the Web-based ordering system; however, lower unit costs can be anticipated.

Proposed Solution

McMahon must meet with his ZTM counterpart to improve their relationship. He must assure ZTM that a reasonable profit is available and make spare parts production easy and non-obtrusive (to the Mustang production line). As the sole-source prime contractor, ZTM is a good candidate for a long-term contractual relationship with DLA. Together they can determine the contract structure and establish incentives.

The practice of ordering parts one at a time must be fixed. Two options are available to address that: either ZTM can switch to a lean manufacturing process, or DLA can develop a predictive model to order parts in batches. As the predictive model is probably cheaper and easier to implement, that's what McMahon should pursue. DLA should start by assessing existing data as well as querying both ZTM and users to determine the frequency of need for the various spares. With this model, McMahon (and ZTM) will know the real need for consumable spares—which parts, how many, and how often. Together they should determine the minimum acceptable ordering quantities and automate the ordering when inventory levels merit it (with DLA intervention possible to account for fluctuations in actual usage, such as S&S situations). ZTM would maintain the inventory and use commercial shipping practices to deliver directly to the user.

A Web-based ordering system would cut down on both customer and DLA processing time but still allow DLA the insight capability to monitor the process and take cor-



rective action as necessary. Finally, ZTM should develop and maintain a database that monitors all parts and all subcontractors/vendors so that obsolescence issues can be addressed before they become critical.

Measures of Success

Although a reduction in the turnaround time from user request to parts receipt would be a good indicator for McMahon, an increase in the operational readiness level is the ultimate measure of success for the system. A DLA customer satisfaction survey would help to determine further opportunities for improvement. And continued communication with ZTM will allow for informal assessments of the government/contractor relationship.

Jim Carter

The advantages of modern information technology (IT) weren't employed for Mustang at DLA/ZTM. The improvements in turnaround time offered by modern IT would be a paradigm change for ZTM and DLA. ZTM and its subcontractors didn't use lean administration and Six Sigma. Should McMahon institute a massive change in the process, a lean administration transformation? Or should he simply work within the boundaries of the existing process to eliminate bottlenecks and accelerate it?

Issues

The time to get a requisition from the user to DLA to ZTM to a subcontractor is 140 days and could be reduced to five days with Web-enabled processes. When inventory reaches reorder point, parts could be ordered with normal lead time.

The use of IMPAC cards removes DLA and ZTM from the process and doesn't ensure purchase of certified (quality) parts. Furthermore, the Department of Defense (DoD) and the program management offices lose potential quantity discount savings.

The five-year service support contract awarded by TACOM to ZTM could influence and diminish any potentially out-of-the-box options McMahon may discover. It could be business as usual.

And finally, wartime operations tempo will multiply consumable spare parts use requirements by factors of 10 to 40 times. Without a Web-enabled process surge spares have to be maintained as inventory.

Decision Criteria

The obvious criteria are turnaround time, cost, schedule, and reliability, along with the potential to raise the FMC rate. Other criteria may not be as straightforward. Any far-reaching solution will require a culture change for ZTM, DLA, and their suppliers and customers. So part of the decision criteria must be the ease of overcoming the resistance to change, which could affect the viability of the solution.

Proposed Solution

In the short term, increase on-hand inventory from existing certified sources while initiating and streamlining a qualification program for new companies with replacement parts. This should immediately reduce turnaround time, improve reliability, improve FMC, and lower the costs of parts to DoD through economic quantity pricing. It may increase DLA's inventory storage costs.

In the long term, develop and implement a Web-enabled ordering process to reduce cycle time, and adopt other lean manufacturing measures. Set contractor incentives (award fees) based on FMC rates. Encourage the establishment of smaller companies to administer this process so that ZTM can focus on production. Make ZTM fully re-

sponsible for supplying parts as part of a total system responsibility program.

Measures of Success

Although it is difficult to measure, the evolution of the culture will be a critical factor. In the short term, success can be accomplished without a culture change, but not in the long term. Warfighter satisfaction and the reduction in work-in-process inventory are excellent measures. Measuring the added value and a waste-free value stream of each organization in the process will institute a focus on continuous improvement. The more typical metrics used to rate the TMP are important as well. People and companies focus their attention and efforts where leadership focus their attention and dollars.

The Mustang Case as a Teaching Tool

I use the Mustang case in my DAU classroom to give potential PMs an opportunity to make significant, reality-based decisions in a safe environment. Secondary objectives are to focus the students' thoughts on the role that DLA plays in the weapons systems acquisition process, make them consider how the mission of the program management office is intertwined with the mission of DLA, and to provide them with a personal understanding of the difficulties encountered by a WSSM. As a tertiary objective, the case also provides an opportunity to discuss how PMs influence contractor motivations with incentives.

The proposed solutions from Roman, Possehl, and Carter are similar in some respects and different in others, highlighting one of the most powerful aspects of the case teaching method: reality demands integration. That integration leads each student to interpret the scenario from his or her functional perspective, each understanding a slightly different situation. Equally important are student belief systems, personality preferences, and experiences—in other words, individual perspective. It is the differences between these factors that bring about the essence of the case method: tension or disagreement.

Classroom discussion encompasses an in-depth look at potential methods to improve the service DLA provides by examining alternatives available to McMahon. As the students discuss the dilemma in the case, my questions focus their attention on three main areas: contractor motivations; the support parts process; and IMPAC card ramifications. I ask, "Why isn't the contractor motivated to return quotes in a timely manner?" And then, "What can we, the acquisition, technology, and logistics workforce, do to motivate the contractor?" The questions lead to a debate/discussion of contractor priorities and financial profitability. The desired outcome is discussions of how the AT&L workforce impacts contractor priorities by incentives and of alternative ways to incentivize contractors considering the impact on each phase of the acquisition life cycle.

Another area ripe for discussion is the role of DLA in the acquisition process. "Is DLA's role obsolete?" I ask. The ensuing debate rages as each individual student must make some difficult ethical decisions. Does a PM make a decision that is best for his or her program or Service or for the DoD? Should a PM pay a higher price for a nonstandard part in a tight budget environment because it is more readily available on the local market? To the very astute students, these questions integrate DLA's role and the use of IMPAC cards, and they discover and share the adverse financial and quality impacts on the PMO and ultimately DoD of using IMPAC cards to purchase parts. But I am always prepared to play devil's advocate and ask the question, "How does the use of IMPAC cards decrease the effectiveness of DLA?" This discussion emphasizes how IMPAC card purchases mask true inventory control levels, and it highlights the higher price paid for the parts, helping students understand how a seemingly innocuous action—IMPAC card usage by one user—could degrade the efficiency and effectiveness of the DLA and DoD if adopted by all users.

Risk identification and mitigation are integral parts of solution implementation and when discussed in detail, force students to the foundation of critical thinking—questioning their beliefs and assumptions. It, along with the case assignment questions, is the basis of the entire discussion. Together, they lead students to answer the following questions: What are the most important decision factors? How do they influence my decision? And what is the associated risk?

Case Methodology Beyond the Classroom

The case method is a powerful learning tool because it integrates all aspects of an issue or decision. It forces students to work as a team and to consider different viewpoints. When it is set up properly, the case method is also a valuable problem-solving tool for a PM. Gathering the information required to develop a case forces the decision maker to consider and prioritize the decision factors and to ferret out possible alternatives and assumptions, activities that greatly improve the decision-making process. The Defense Acquisition University is available to assist the AT&L workforce in this endeavor by facilitating team discussions using the case teaching methodology.

Editor's note: The author welcomes comments and questions and can be contacted at john.horn@dau.mil.

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