

# Doing Less With More

## The Pitfalls of Overfunding

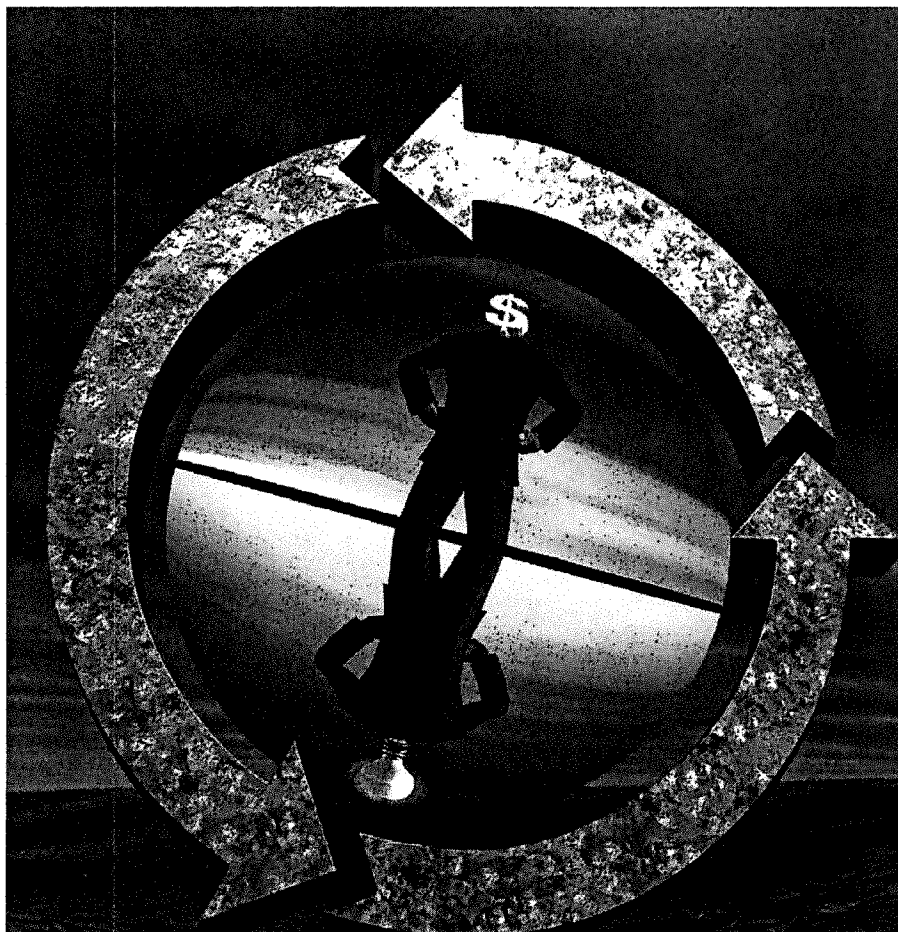
*Capt. Dan Ward, USAF*

### AUTHOR'S WARNING

*This article may offend the professional opinions and sensibilities of certain individuals. Discontinue reading if any of the following occur: itching, aching, dizziness, ringing in ears, vomiting, giddiness, auditory or visual hallucinations, loss of balance, slurred speech, blindness, drowsiness, insomnia, profuse sweating, shivering, or heart palpitations. May be too intense for some readers and not intense enough for others. No program managers were harmed during the production of this article. Some restrictions apply.*

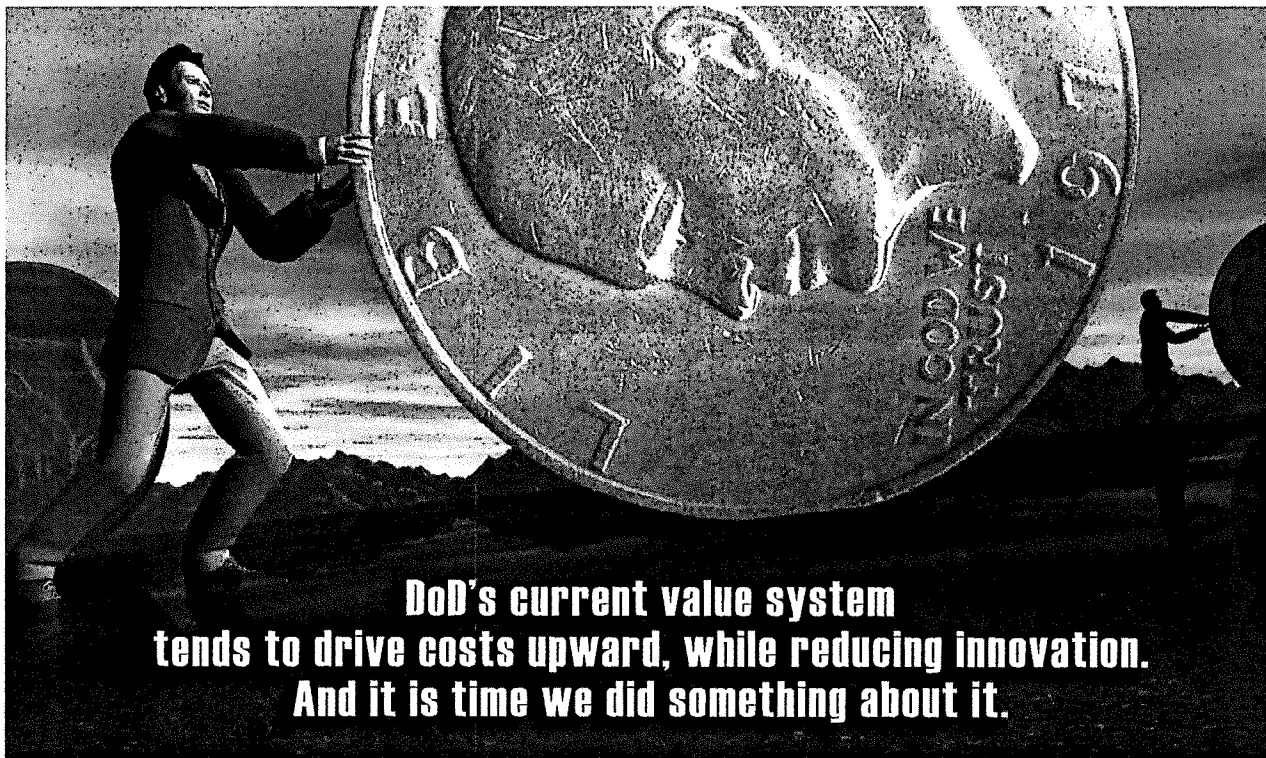
**L**et me get right to it: the Department of Defense (DoD) acquisition community today has too much money. There, I've said it, and it feels good. It may be a career-limiting opinion, but after 10 years in this business, I can confidently (albeit naïvely) conclude we have too much money. More important, I contend this overfunding is limiting our ability to innovate, which has negative consequences for America's warfighting capabilities. Now that I have your attention, let me explain how I reached this conclusion.

In a word, research. As I looked for common threads within innovative development projects, I quickly discovered something many readers probably knew



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tends to drive costs upward, while reducing innovation.  
And it is time we did something about it.**

already: I am not the first to contend overfunding is a problem.

#### **It's Been Said Before**

Air Force Col. John Boyd and his collection of military reformers sounded a similar call in the early 1980s. In fact, Pierre Sprey, one of Boyd's acolytes, wrote *A Case for Better and Cheaper Weapons*, published in 1984. He compared "cheap winners" like the highly lethal AIM-9D/G Sidewinder (\$14,000 each) to "expensive losers" such as the less effective AIM-7D/E Sparrow (\$44,000 each). He argued that increased spending will yield less capability, particularly if we continue to buy complex, vulnerable weapons that are costly to operate. My research didn't stop there.

Navy commanders James Fitzsimonds and Jan van Tol observed in the Spring 1994 issue of *Joint Force Quarterly* that "revolutionary changes [in technology and concept of operations (CONOPS)] do not generally occur during war. ... Militaries are driven to innovate during peacetime by the need to make more efficient use of shrinking resources." The article concludes: "Innovation is not necessarily or even primarily a function of budget. Many of the interwar innovations came at a time of *low* budgets and *small* forces" (emphasis added).

On the other side of the ledger we have the Cold War tactic of large defense spending, which was apparently an effective weapon against the now-defunct U.S.S.R. However, high rates of military research and development

(R&D) spending in that time period did not exactly produce the anticipated technological innovations—Strategic Defense Initiative, anyone? Instead, we find things like the Comanche helicopter's expenditure of 21 years and \$8 billion with zero actual helicopters to show for it. And there's also the recently cancelled \$11 billion Crusader, the on-again-off-again-on-again B-1, the on-again-off-again-on-again V-22, and so on. While the newspapers in the 1980s never did get those \$900 hammer stories quite right, it's not clear that large Cold War R&D budgets delivered what was promised. Fortunately, the Soviets were able to accomplish even less—perhaps in part because they outspent the United States by \$300 billion between 1970 and 1980.

#### **A Tale Of Two Weapons**

Wilber D. Jones' outstanding book *Arming The Eagle* lends further support to the overfunding thesis. First published in 1999, this book rigorously documents the history of U.S. weapons development and acquisition since 1775. It is full of fascinating snapshots and stories about successes and failures in military technology development. Let's take a look at the very different stories it tells about two infantry weapons: the Bazooka and the M16.

Early in World War II, the Bazooka went from drawing board to the battlefield in 30 days—surely some kind of record. A contemporary article in *Liberty* magazine breathlessly opined the \$19 rocket rifle "can almost duplicate the devastation wrought by a 155-mm howitzer that costs \$25,000!" While the assessment of this weapon's effec-

tiveness is undoubtedly overstated, the Bazooka's impact on the battlefield was undeniable, and the cost was ridiculously low.

In contrast, the M16 took 20 years to go from concept to capability, at a pricetag many orders of magnitude beyond the 30-day wonder. It turns out both weapons had similar operational limitations upon deployment: neither performed as advertised. The important thing to note is the Bazooka's problems came to light quickly and were addressed quickly (the first major Bazooka upgrade was accomplished in six months). The M16's bugs took longer to find, longer to fix, and cost considerably more.

This doesn't establish a causal relationship between large budgets and low capability/low innovation (but hang on, we'll get there). It does show the M16's decades-long, disciplined, neat, orderly, and well-funded development effort didn't guarantee the system's operational effectiveness. Nor did the Bazooka's month-long, quick-and-dirty, low-cost approach. The key to field success in both situations was (drumroll please) actual field experience and direct user feedback. The inexpensive, rapid developmental approach of the Bazooka got the users involved much sooner, which may very well be the key to this whole thing.

### **War and Peace, Fact and Fantasy**

Let's return to the assertion of Fitzsimonds and van Tol that most innovation happens during times of peace and small budgets. Specifically, let's focus on the peacetime dimension. Why would wartime not be a cauldron of innovation? What leads to peaceful innovation? And what's the connection to small budgets?

During wartime, new military technology development is left largely to technologists and engineers like me. We tend to know a lot about technology and its limitations and relatively little about combat environments and their requirements. Only when the shooting stops do adequate numbers of combat-experienced individuals have the opportunity to spend their intellectual capital on new system requirements and developments. Of course, in the case of the Bazooka, its absurdly short development timeline gave soldiers an opportunity to provide real-time combat truth to the developers, who could then address the weapon's shortfalls. But this is clearly an exception to the peacetime-innovation trend.

The principle behind the parable is this: technology developers tend to have facts about technology and fantasies about the operational (i.e., combat) environment. In contrast, users tend to have facts about the operational environment, and fantasies about what technology can do. Innovation seems to require the latter combination, which accepts the limitations of the foxhole and puts innovative pressure on technology, not the other way

around. It leads to creative technologies and approaches that are well-suited for the environs in which they will be used. The alternative (and unfortunately, traditional) approach—technology facts and operational environment fantasies—tends to be neither as creative nor as effective and often makes absurd assumptions or demands on combatants as they try to integrate new, rigid technologies.

### **Back To the Bazooka**

What would have happened if the Bazooka budget had been larger? For starters, its development would have taken longer if only because it takes time to spend money. Larger budgets get more oversight, which takes more time, which—in a cruel irony—increases the overall cost. (More people overseeing more dollars requires more people and more dollars—a financial snowball effect). Also, the risk of analysis paralysis increases in direct proportion to the size of the R&D budget.

What does this have to do with low budgets? Just about everything. When something is expensive, there is a natural and understandable tendency to keep it away from the kids. Exquisite artifacts are treated with great care and shielded from those with grubby hands who might damage or break them. But a \$19 piece of steel pipe with a few doodads welded to it (a Bazooka) can be sent into a rigorous combat environment without fear of breakage, in part because it is simple and robust, and in part because it is inexpensive enough that its builders don't mind if it breaks.

The conclusion is unavoidable: increased development costs tend to have an isolating effect, even for supposedly rugged military technology, as users are kept at arm's length and as development times stretch into decades. This unfortunate attempt to disinvolve users may be rooted in good intentions, but ultimately it limits the systems' effectiveness by keeping ground truth out of the equation. Early user involvement is a prime driver for innovation and effectiveness, and rapid, cheap systems tend to bring users on board sooner. Large wallets just get in the way, blocking one of the key elements of successful technology development.

### **Reforming Rewards and Recognition**

For the sake of argument let's say I've convinced someone that overfunding is a problem. The logical next question is "What do you propose we do about it?"

I'm glad you asked!

Most readers have probably noticed the DoD acquisition profession tends to use dollar figures to quantify job progression, equating increased program costs with professional maturity. If you managed a program worth \$1 million last year, your chances for promotion are better if

you manage a program worth \$10 million this year. That's a problem. We need a different set of values and metrics where dollar figures and professional maturity are not automatically equivalent, where an up-and-coming officer hears instead, "Well, Captain Smith, you did good things with \$10 million last year. Now let's see what you can do with \$1 million."

The idea is not simply to slash budgets on existing programs, although that is often a good idea too. The point is to avoid turning our noses up at a program just because it's inexpensive, or overvaluing a program just because it costs a lot of money.

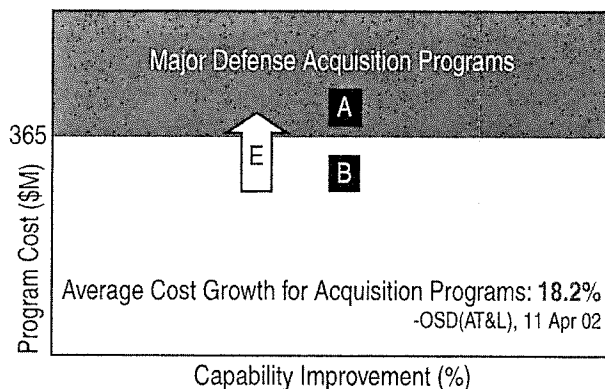
### Redefining MDAPs

The situation is more pronounced at the higher levels. For example, take major defense acquisition programs (MDAPs). In order to be an MDAP, an acquisition program must either be designated by the under secretary of defense (acquisition, technology and logistics) USD(AT&L) as an MDAP or be estimated to require an eventual total expenditure for research, development, test, and evaluation of more than \$365 million in FY 2000 constant dollars or more than \$2.190 billion in procurement in FY2000-constant dollars. That essentially means a system becomes an MDAP when it reaches a particular dollar value (Figure 1).

Shouldn't capability come into the equation somewhere? At the moment, it does not, and that is kind of embarrassing. Would it not make sense to designate a system as "major" based on the degree to which it contributes to national security, provides a new/necessary functionality, or otherwise makes our forces more effective? Currently, all it takes to be "major" is a big price tag, no matter how much or how little the system improves the users' capabilities.

The figures illustrate this point. In Figure 1, which system, A or B, is more prestigious and better for your career? The more expensive one (System A) of course, even

FIGURE 1. MDAP Defined



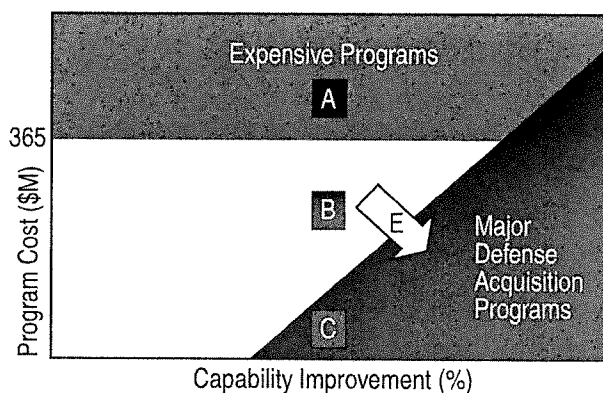
though it provides the same increase in capability as the less expensive one (System B). In fact, a cost overrun for System B could push it over the line and turn it into a "major" program. This causes subtle (and not-so-subtle) environmental pressure in the direction of increased cost, as depicted by the arrow. This may not be the only reason for the 18 percent average cost growth, but it is certainly a contributing factor.

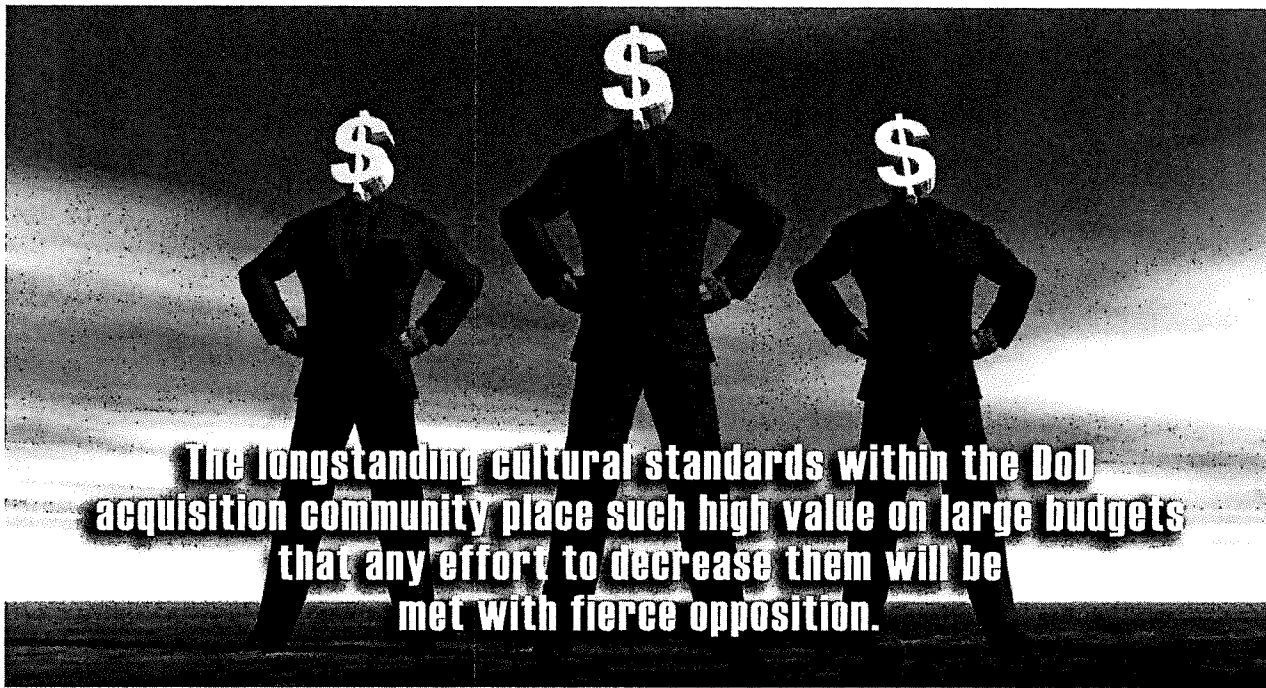
There is a better way. You see it in Figure 2. In this approach, all the statutory requirements for reporting, testing, oversight, and so forth of programs costing more than \$365 million would still apply, but we would now call those programs what they are—"expensive." Not good or bad, not major or minor. Simply expensive defense acquisition programs. EDAPs. Even if they are worth every penny or are a bargain at twice the price, they cost a lot of money and everyone knows it. What a refreshing change it would be to acknowledge that reality.

This wouldn't fix all our problems, nor would it guarantee innovation all the time, but it would be a step in the right direction. For example, in this proposed paradigm, which program (A, B, or C) is more prestigious and better for one's career? The MDAP (C) of course, which delivers a significant improvement in capability at a low cost. Who would want to be the manager of System A (the EDAP)? One implication of this approach is that cost overruns could result in the loss of MDAP status, unless there is a corresponding improvement in capability. Environmental pressure in this scenario is down and to the right, in the direction of lower costs and improved capabilities, as it should be.

In an interview with NASA's *ASK* magazine, Terry Little, (acquisition advisor of the Missile Defense Agency) addressed a common misconception that "if you emphasize something like speed or cost, everything else goes in the toilet." Contrary to that often-held belief, Little's experience indicates that "people working the problem won't let that happen. ... What you give up [by focusing

FIGURE 2. MDAP Redefined





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on speed or cost] is very modest in comparison to what you gain." All I can say is, "Amen, Mr. Little. Amen."

### **Time To Act**

The history of military innovation clearly points to the value of small budgets and the dangers of large ones. I think the M16 and the Bazooka are interesting examples, but the 21st century is already full of similar situations we could have discussed, particularly in the areas of information technology and unmanned aerial vehicles.

High technology is not terribly expensive these days, and maybe it never was. But this whole thing is really not about high or low tech. Our mission is to deliver innovative, effective capabilities to our users, and it's amazing what you can do with \$19 worth of steel pipe and assorted parts. I don't expect ever to see a \$19 aircraft carrier; there will always be a need for expensive systems. I simply contend the DoD's current value system tends to drive costs upward, while reducing innovation. And it is high time we did something about it.

My own, admittedly limited, experience with both expensive and inexpensive development efforts resonates with the academic research. My teams and I typically did more with less and the most when we had the least. That is, our innovation and our impact on operations were most significant when our resources were the most limited. It is hard to avoid concluding that small teams + thin budgets + short timelines tends to = significant innovation and combat effectiveness. If the DoD as a whole is aiming to maximize bang for the buck, it helps to recognize that bang and buck are often inversely proportional.

This is not a call for fiscal discipline in a political sense, and it's not about the government's spending less money for thrift's sake, although that's not a bad idea. It is about spending less money for technology's sake and for the warfighter's sake. Counterintuitive though it may be, if we want to provide America's soldiers, sailors, airmen and Marines with innovative capabilities, we need to spend less money developing systems.

Reducing R&D budgets is not a cheap fix, but nor is increasing spending. Frankly, there is no sure-fire way to produce innovative technologies, and spending lots of money is perhaps the least effective approach imaginable. Getting actual feedback from combat-experienced users tends to be highly productive, and large budgets usually get in the way of that communication.

How much should we cut from the budget? More than we will. The longstanding cultural standards within the DoD acquisition community place such high value on large budgets that any effort to decrease them will be met with fierce opposition. One way to begin influencing the culture is by redefining MDAPs as outlined here. One might reasonably ask how we would recognize and reward our people for doing good work if dollar figures are no longer used to measure professional competence. Look again at Figure 2. The top performers should be moving down and to the right (or at the very least, to the right) as their careers progress.

What should we do with the money we save? Frankly, I don't care, as long as nobody tries to give it to me.