

DAU OPENS MID-ATLANTIC REGION

MAY - JUNE 2002

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E-LEARNING MAGAZINE NAMES DAU PRESIDENT
"CHAMPION" OF DISTANCE LEARNING

PROGRAM MANAGER

EVOLUTIONARY ACQUISITION

CRITICAL SUCCESS FACTOR
ANALYSIS FOR
DoD RISK MANAGEMENT

OPPORTUNITIES FOR
WORKING CAPITAL FUND
ORGANIZATIONS AND THEIR
CUSTOMERS

2002 NUNN-PERRY AWARDS

Defense Acquisition University Welcomes New Commandant April 12, 2002

Michael W. Wynne, Principal Deputy Under Secretary of Defense (Acquisition, Technology and Logistics), passes the DAU colors to Army Col. Ronald Flom, who becomes the new Commandant of the Defense Acquisition University.



**DAU Knowledge Management
Officer John Hickok Earns
U.S. Distance Learning
Association Award for Most
Outstanding Achievement by
an Individual in Government**

PROGRAM MANAGER

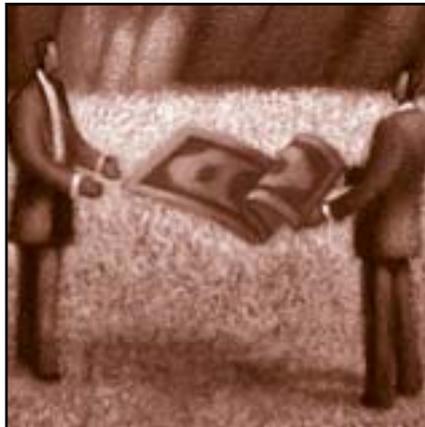
Vol XXXI, No. 3, DAU 168

Cover: Glenda Mathis, U.S. Distance Learning Association (USDLA) President; DAU Knowledge Management Officer John Hickok; and Dr. John G. Flores, USDLA Executive Director.



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2002 Distance Learning Association Awards
Christina Cavoli • Collie Johnson
DAU named winner for second consecutive year. John Hickok, DAU Knowledge Management Officer, singled out as individual award winner.



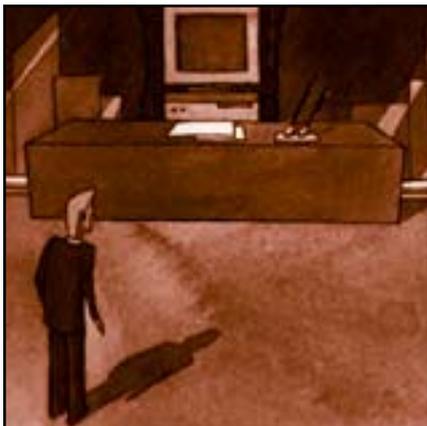
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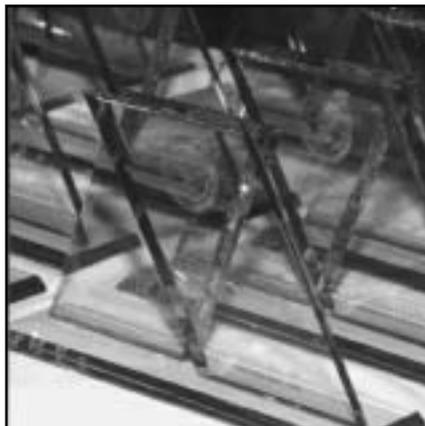
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2002 Distance Learning Association Awards

DAU Named Winner for Second Consecutive Year—Knowledge Management Officer Honored

CHRISTINA CAVOLI • COLLIE JOHNSON

FORT BELVOIR, Va. (April 10, 2002)—How will the digital age change the way we learn? Using technology to improve and expedite learning, to excite and entice students, teachers and administrators, is a hot topic for educators at all levels—academic, professional, business, and government. The widespread interest in applications of distance learning was evident at the 12th Annual e-Learning Conference & Expo, held April 8-11 at the DC Convention Center.

Thousands of corporate executives, education professionals, and government and military personnel attended the conference. Keynote speakers included former Mayor of New York City Rudolph Giuliani. A crammed exhibit hall blazed with innovation, new ideas, demonstrations, possibilities—all showcasing the marriage of technical achievement with educational goals to produce a superior product delivered in a more useful way.

In the arena of distance learning, the Defense Acquisition University (DAU) is receiving its share of awards and recognition for innovative programming, forward-thinking ideas, and individual excellence.

On April 10, the U.S. Distance Learning Association (USDLA) presented 11 Distance Learning Awards to professionals, organizations, companies, and institutions for excellence in teaching, programming, and outstanding individual achievement. DAU, for the second year in a row walked away a winner, earning two of the coveted awards.

Cavoli is a freelance writer and Johnson is managing editor of Program Manager Magazine, DAU Press, Fort Belvoir Va.



Excellence in Distance Learning Programming—Government Award—Presented to DAU Vice Provost Dr. J. Robert Ainsley, and DAU Provost Richard Reed, representing DAU President Frank J. Anderson Jr. Pictured from left: Glenda Mathis, USDLA President; Ainsley; Reed; and Dr. John G. Flores, USDLA Executive Director.

The purpose of the USDLA Awards is to acknowledge the efforts of innovators and “pioneers,” and highlight those that are excellent in the field. Categories included Higher Education, Government, K-12 Education, Corporate/Business, and Telemedicine.

USDLA President Glenda Mathis introduced this year’s award winners. “A few years ago,” noted Mathis, “it was hard to explain the concept of distance learning, much less find effective examples. Now, there is an explosion of high-quality programs and instructors in distance learning.”

Excellence in Distance Learning Programming—Government Award

DAU Provost Richard Reed and Vice Provost Dr. J. Robert Ainsley, accepted the USDLA Excellence in Distance Learning Programming—Government Award on behalf of DAU, for providing an outstanding model of distance learning. DAU President Frank J. Anderson Jr., unable to attend the awards ceremony, commented on this year’s win.

“Technology has fundamentally changed the way we live and work. DoD is committed to moving to an e-Business en-



U.S. Distance Learning Association (USDLA) Most Outstanding Achievement by an Individual in Government Award—Presented to DAU Knowledge Management Officer John Hickok at the 12th Annual e-Learning Conference & Expo, April 10, 2002, at the DC Convention Center. Pictured from left: Glenda Mathis, USDLA President; Hickok; Dr. John G. Flores, USDLA Executive Director.

corporating technology provides convenient, economical access to education, training, performance support, and expert advice to all members of the DoD acquisition community.

DAU works to effectively deliver a quality product to an audience of over 138,000 students worldwide. Since 1998, nearly 42,000 students have completed distance learning classes; the re-engineering of the Acquisition 101 (ACQ-101) course alone has resulted in a 157 work-year return to the workforce, which translates into an annual productivity return of almost a million dollars.

Currently, annual DAU online course graduates exceed 12,000. DAU predicts that by the end of 2002, traditional classroom education will drop to 64 percent for all DAU students. Online instructional time has increased from 15,570 hours in 1998 to over 1.5 million hours in 2002. Online course graduates at DAU will top 60,000 this year. These numbers indicate an improved learning environment that also offers reduced education and training costs.

environment. Our goal is to facilitate this business transformation by training the way we will work—*e-Learning* to support *e-Business*.”

Anderson said that DAU must accelerate the transformation of DoD acquisition training, and that smartly applying

technology would facilitate the university's journey into the future.

Distance learning complements the training mission of DAU: to provide a program that fully embraces certification training, performance support, and a culture of continuous learning. In-

Most Outstanding Achievement by an Individual in Government Award

The Most Outstanding Achievement by an Individual in Government Award went to DAU Knowledge Management Officer John Hickok, for his exemplary contribution to the DAU Distance Learning

DAU Faculty, Staff Combine Efforts to Develop Comprehensive Content and Online Performance Support and Learning Modules (PSLMs)

- Air Force Maj. Jim Ashworth (Policy)
- Bill Bahnmaier (Risk Management, Program/Project Scheduling)
- Dave Brown (Systems Engineering)
- Steve Brown (Logistics)
- John Claxton (Test and Evaluation)
- Dan Costello (PM Briefings)
- Tom Dolan (Acquisition Excellence)
- Dr. Owen Gadeken (Leadership)
- Dr. Mary-jo Hall (Strategic Direction and Balanced Score Card)
- Larry Heller (Total Ownership Cost)
- John Kelley (Integrated Product and Process Development/Integrated Product Team)
- Norm McDaniel (Acquisition Strategy)
- Bill Motley (Manufacturing Management)
- Cathy Pearson (Civilian Personnel Management)
- Robert Pratt (Earned Value Management)
- George Prosnik (Software Management)
- Julian Roberts (Business, Cost Estimating, and Financial Management)
- Bob Stryjewski (Cost As an Independent Variable)
- Chip Summers (Contract Management)
- Randy Zittel (Modeling and Simulation)

program. Hickok's vision and leadership have been pivotal in the conception and implementation of the online DAU Project Management Community of Practice. Allowing global acquisition and logistics personnel a way to collaborate and disseminate information and best business practices, Community of Practice supports continuous learning and performance support.

"Over the last several years the ship of DAU has been slowly changing its course," said Hickok, "from purely classroom instruction to *lifetime* education, training, and job support for the entire AT&L workforce."

Hickok emphasized that the success of DAU's initiatives in Knowledge Management, and specifically with respect to providing online performance support to the AT&L workforce, is due to the tireless efforts of DAU's faculty and the critical support of DAU's leadership team.

He noted that several members of the DAU faculty and staff (see preceding

page) have been instrumental in developing comprehensive content and online Performance Support and Learning Modules, or PSLMs.

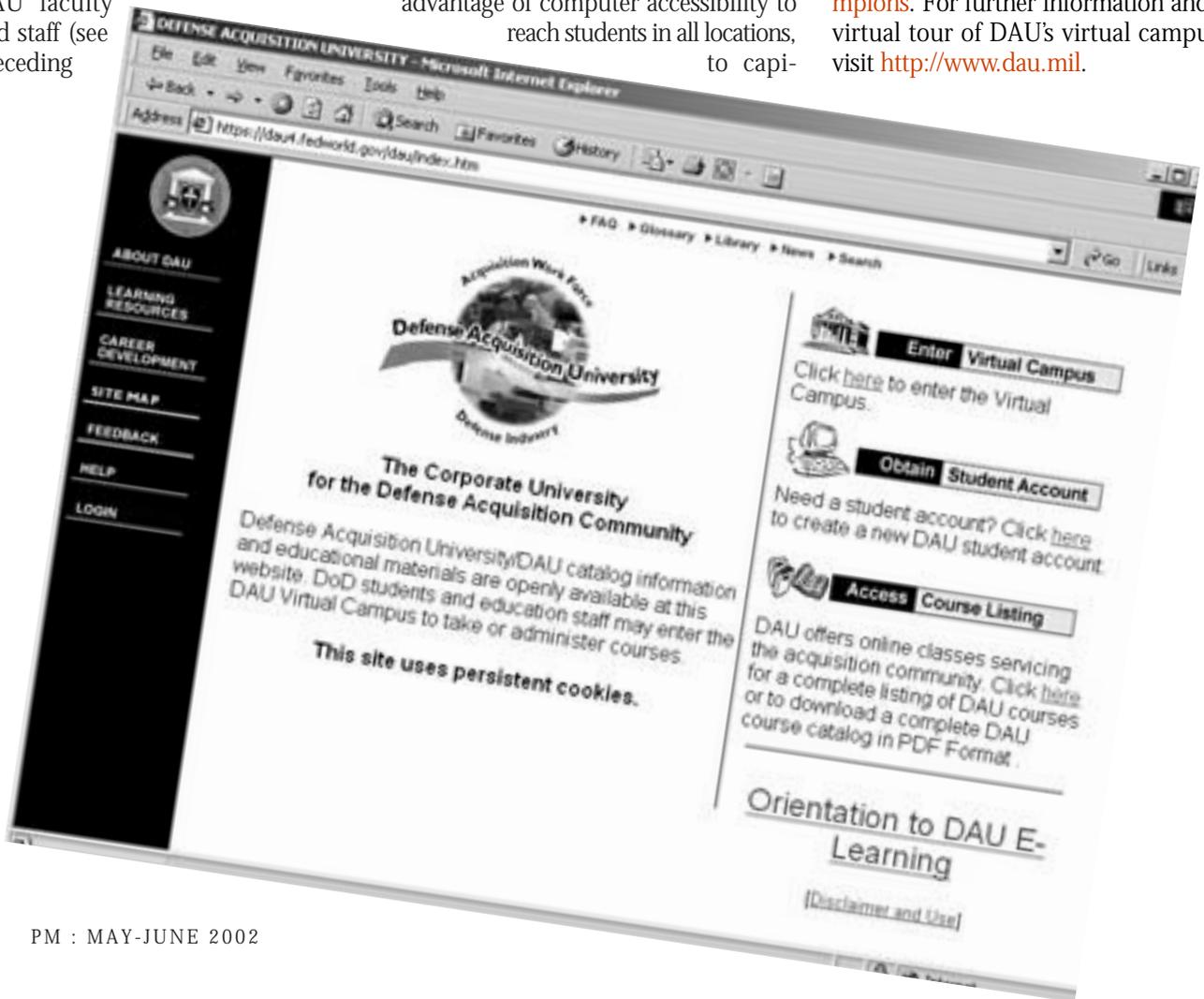
DAU, according to Hickok, plans to use its PSLMs to enable the development of some 15 career field communities of practice to support the job needs of the AT&L workforce across the Office of the Secretary of Defense, the Services, and Agencies. He added that to date, DAU Professors Bill Bahnmaier, Dave Brown, and Chip Summers have been groundbreaking leaders in the development of Communities of Practice for Risk Management, Systems Engineering, and Major Weapon System Contracting respectively. These Communities of Practice, he explained, have been developed under the Program Management Community of Practice, developed jointly by the Navy's Acquisition Reform Office and the Defense Acquisition University.

e-Learning No Longer a Future Goal
Distance learning, or e-Learning, takes advantage of computer accessibility to reach students in all locations, to capi-

talize on time, and provide a greater degree of individualized training. E-learning uses the power of the Internet and computer-based instruction to make learning accessible anytime, anywhere. Instructors and students can take advantage of technology to create an interactive and responsive learning community, regardless of physical location.

The effectiveness and efficiency of e-Learning over the traditional classroom environment are well-documented. Studies have shown that distance learning produces better test scores in 98 percent of students, while decreasing instructional time by one-third.

DAU, e-Learning, and USDLA
With a current membership of over 2000, USDLA is a leading source of distance learning information and policy. To read more about the organization, visit their Web site at <http://www.usdla.org>. For other success stories in the field of distance learning, visit <http://www.elearningmag.com/morechampions>. For further information and a virtual tour of DAU's virtual campus, visit <http://www.dau.mil>.



e-Learning Magazine Names "Champions" of Distance Learning DAU President Cited for Leadership, Vision



Frank J. Anderson Jr.
President, Defense Acquisition University

Defense Acquisition University President Frank J. Anderson Jr., has been selected by *e-Learning Magazine* as a 2002 real-life "Champion" of distance learning for his leadership and vision in the field of distance learning. *e-Learning Magazine* is the e-Learning industry's voice for management leaders who drive technology-enabled learning and training.

"Champions" were selected from over 100 nominations of individuals and organizations that have made great strides in distance learning. Anderson's development of a rapidly growing Distance Learning program for DAU was singled out for providing a superior e-Learning model: an improved learning environment that capitalizes on technological

possibility while driving down the cost of training and education.

Anderson became involved with e-Learning as an e-student. As leader of the U.S. Air Force's contracting organization, he enrolled in an e-Learning course that allowed him to take the course when it was convenient. His first experience as an e-Learning provider was in his current position as DAU President. His challenge was to develop strategic direction and an overarching e-Learning vision that accurately communicated value-added contributions.

Under his guidance, online instructional time at DAU increased from only 15,750 hours in 1998 to over 1.5 million hours in 2002. Likewise, the number of course

graduates at DAU will increase to over 60,000 this year.

For other success stories in the field of technology-enabled learning and training, visit <http://www.elearningmag.com/morechampions>.

Acquisition and Logistics Excellence Week 2002 **Services, Agencies, All DoD Acquisition & Logistics Organizations** **to Design Their Own A&LE Week Activities**

In a March 8 memorandum, Under Secretary of Defense (Acquisition, Technology and Logistics) E.C. "Pete" Aldridge Jr. announced that instead of a DoD-wide Acquisition and Logistics Excellence (A&LE) Week, each Service, Agency, and organization should select a time during the year to focus on acquisition and logistics excellence, and then design their own A&LE activities. As in past years, he emphasized that the time should be set aside to share implementation successes and challenges, and determine how best these successes can be applied to respective missions.

"The Defense Acquisition University," said Aldridge, "will support your efforts." Toward that end, DAU stands ready to offer its support for A&LE events planning. The University has opened an A&LE Activities Web site at <http://www.dau.mil/alea/> that lists

Service/Agency/Regional points of contact for your A&LE Week activities. In addition, the DAU regional campuses are also available to provide training resources and help develop materials tailored to each organization's needs.

"We are excited about the opportunity to team with you and share the benefits provided by DAU's transformation to a regional campus concept," says DAU President Frank Anderson Jr. "Our goal is to support you in accelerating implementation of the Department's acquisition and Logistics initiatives."

Editor's Note: As we go to press, the David Packard Excellence in Acquisition Team Awards will be presented by Aldridge in a separate June 2002 ceremony at the Pentagon (date and time to be announced).

Evolutionary Acquisition

Breaking the Mold—New Possibilities From a Changed Perspective

ALEXANDER R. SLATE

I began this article to help explain Evolutionary Acquisition (EA) to the people with whom I work—many of whom were asking questions. Over the course of writing it, the purpose of EA became increasingly clear. Armed with increased knowledge of EA and its potential for application DoD-wide, I began to discuss some particular aspects of how EA can and should work to the advantage of the acquisition, technology, and logistics workforce. And I began to see how EA could ultimately work to the advantage of the men and women of our Armed Forces—the warfighters and end users for whom we acquire systems. Presented here are my particular opinions—not Air Force or DoD policy—about how we can do our jobs better.

Why EA is So Attractive

EA is really nothing new. Those involved in software development have been using a process called spiral development for a number of years. Another analog of the EA concept is Pre-Planned Product Improvement (P3I).

However, I would only go so far in comparing P3I to the current concept of EA. The differences lie in the *application*; the fact is that as we approach EA, we are willing to be a little more revolutionary in breaking the mold to acquire systems for the U.S. Air Force (USAF) and the Department of Defense (DoD).

Slate is an acquisition advisor for the Acquisition Center of Excellence at Brooks AFB, Texas. His acquisition career experience includes serving as a test manager, program manager, and team lead for a Systems Program Office. He is Level III-certified in Program Management, Test and Evaluation, and Systems Planning, Research, Development, and Engineering; and Level I-certified in Logistics.



P3I

P3I programs worked like this. Within USAF, we would have a systems requirements document—nowadays we call them ORDs (Operational Requirements Documents). The ORD would give us the user's desired end state. In the real bad old days, these simply came as a singularized set of requirements; now we at least have thresholds and objectives.

Sometimes requirements were not achievable. For many reasons we couldn't always give users exactly what they wanted. Let's ignore things like not having enough money and contradictory requirements and concentrate on available technology. Sometimes, the state-of-the-art just wasn't there, but in time perhaps technology could eventually get us there. So, we would plan and proceed with our acquisition programs.

In addition to planning the immediate acquisition, we would also do one or both of two things. The first course of action would be to follow the state-of-the-art and insert capabilities into the program as soon as they were ready during the initial procurement. The second course of action would be to field capabilities according to the state-of-the-art at the end of the procurement and "fix" the item with up-to-date technology after the fact. In either case, the initial procurement would be a full-scale program, normally taking anywhere from three to five years to complete.

EA should differ from P3I in that our understanding of requirements needs to change. User and acquisition personnel need to cooperate much more closely, and to begin that cooperation earlier in the process. Also, both users and acquisition personnel need to re-define what we mean by requirements. Requirements are no longer simply technical needs. Think CAIV, or Cost As an Independent Variable (even though I dislike that particular term in this context). Both schedule and cost are also requirements.

The biggest complaint about the acquisition process is the time it takes to complete. The user has a problem—some widget or capability they need—and often need *now!* The timeline that follows is a composite picture of the various programs with which I was familiar from 1983 through 2001.

Typical Program

First, the users generate a Mission Needs Statement. That can take the better part of a year. Then the money people start angling for budget as the users develop

an ORD. If we're lucky, acquisition personnel are brought in about halfway through this process, which can take anywhere from one to two years to complete. Only then do we kick off a program, with market research and an acquisition strategy—Commercial Off-the-Shelf (COTS) or not—which we will optimistically set at six months.

Understand that at some point in the ORD development process (usually fairly early), the field has seen some sort of widget, which they believe will meet their needs. In many cases, the ORD will basically be written around this widget, in addition to one or two "little" capabilities that the users want. Sometimes, however, a breakdown in communication occurs between the field users and the people who write the requirements; as a result, the ORD may not be written so that the widget the field users have identified will even fit or meet their requirements.

Now a year has passed since the field users have identified their widget. Add the acquisition strategy development and we're at a year-and-a-half. From this point on, we will identify elapsed time from user widget identification parenthetically (one-and-a-half years).

Then the acquisition community has to develop a mechanism to actually procure the item, whether it's COTS or not. This means going out on some sort of contract, which means preparing to go on contract. Let's be optimistic and say that getting to the source selection only lasts six months (two years)—and that is *optimistic*, because nine months to a year is more likely the case. Then comes source selection and the program proceeds.

Let's now assume a COTS source selection. Remember that the ORD may or may not have been written to the widget that has actually been chosen by the field users. So, we have Developmental Testing (DT) to see if it meets technical specifications and a full-blown Operational Test (OT) because we've never had this widget in our inventory before (and besides, OT, by law, is done by an

Programs not being allowed to mature to a necessary level will be a real problem if the people and institutions responsible for strategic vision and budget (everyone from agency headquarters staff to Congress) don't have a good understanding of what Evolutionary Acquisition is about and the purposes and goals of the particular program acquisition strategies that will result.

EIGHT ROADBLOCKS TO IMPLEMENTING AN EVOLUTIONARY ACQUISITION STRATEGY

- Roadblock No. 1** Acquisition teams don't exist until too late in the process.
- Roadblock No. 2** Program budgets and schedules are usually determined before the acquisition strategies are completed.
- Roadblock No. 3** ORDs only lay out end-state dreams.
- Roadblock No. 4** Schedule and cost are not really viewed as requirements in the same way that performance requirements are viewed.
- Roadblock No. 5** The mindset that, "Acquisition people don't do requirements and users don't do acquisitions."
- Roadblock No. 6** The color and year of money simply make for a lot of waste.
- Roadblock No. 7** Requirements for a full-spectrum Operational Test and Evaluation (OT&E) on interim capability acquisitions use up a lot of time and money.
- Roadblock No. 8** User buy-in for an Evolutionary Acquisition strategy.

"[a] strategy for use when it is anticipated that achieving the desired overall capability will require the system to evolve during development, manufacture, or deployment."

I like the second definition better, but I'm still not crazy about it.

I believe that we should define EA as the process of acquiring either a new or improved capability where, for whatever reason, it is not possible or not practical to acquire it in a single acquisition. I like my definition for two reasons. First, a core capability may already exist and we may be looking at the next generation. Second, the term "require the system to evolve" used by DSMC somehow seems to reek of the idea of technical insertion.

While there is nothing wrong with technical insertion, that may not be the reason we are using EA. This harkens back to the old P3I process. Sometimes the pressing reason to use EA may be time, not technical performance. Or it may be cost.

At issue is what is really important to the user, and what do they really want? Naturally, what users really want is the ultimate widget that does everything perfectly, never breaks down, and never needs maintenance—they want it in their hands *today*, and they want it to cost no more than \$1.40 a copy. That's only human nature. So the real issue is what widget can be acquired to meet

independent tester). If we lucked out, only another year has elapsed (three years). Then, assuming all is good, we buy the widget and get it out to the field (three-and-a-half years).

That's if the ORD was fairly close to a COTS item. If it isn't, add at least another year for development (four-and-a-half years).

Well, the users get something fielded three-and-a-half to four-and-a-half years after they tentatively identified a widget they needed. Little wonder the perceived need for shortened cycle times is rampant throughout the acquisition community.

Evolutionary Acquisition

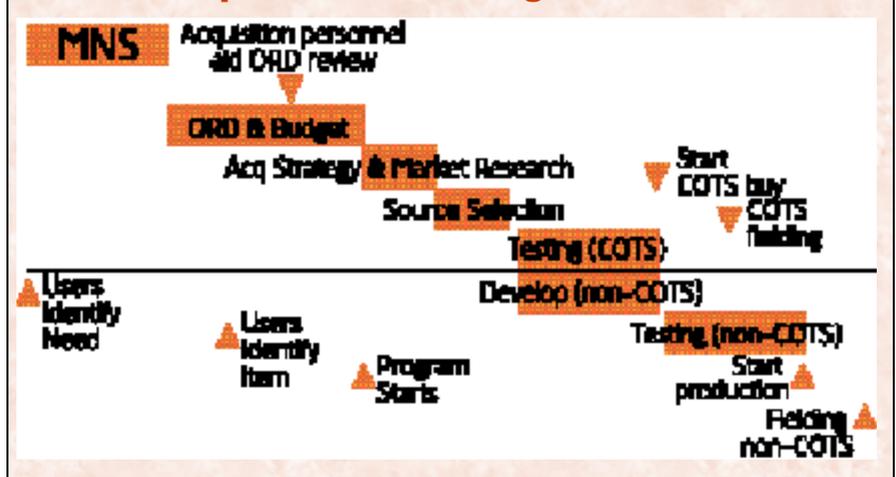
The November 2000 draft *U.S. Air Force Evolutionary Acquisition Guide*, published by the Office of the Assistant Secretary of the Air Force for Acquisition (SAF/AQ), defines EA as:

"[a]n acquisition and sustainment strategy to rapidly acquire and sustain a sup-

portable core capability with the ability to incrementally insert new technology or additional capability."

The Defense Systems Management College (DSMC) publication, *Joint Logistics Commanders Guidance For Use of Evolutionary Acquisition Strategy to Acquire Weapon Systems*, never defines "Evolutionary Acquisition" as such, but does define the EA process as:

FIGURE 1. An Optimistic Classical Program



the end user's needs? What are the pressing requirements?

What the process needs is for us to re-define what we view as Key Performance Parameters (KPPs). If having something—anything—to use in the field in 12 months' time is the most important factor, then our KPP is delivery in 12 months. If it is important that we be able to equip 12 million personnel with a widget and we only have \$36 million to spend, then the KPP is a cost of \$3 a unit or less.

Roadblocks

What currently prevents our current acquisitions from being what they need to be? Also, as we try to implement EA, what will hinder the process?

ROADBLOCK No. 1

Acquisition teams don't exist until too late in the process. And therefore, acquisition strategies don't exist until too late. In our notional "widget" recap of the current process, they don't exist until one-and-a-half years after the users have already figured out what they want in the field. This is even later than the determination of a need.

ROADBLOCK No. 2

Program budgets and schedules are usually determined before the acquisition strategies are completed.

ROADBLOCK No. 3

ORDs only lay out end-state dreams. ORDs need to reflect (to a degree) the acquisition strategy. As a result, programs are always trying to chase everything on the list from Day 1. This is really much more of an issue than might meet the eye at first blush. And because of many factors, including honest differences in the needs of various users, the "users" (in this case the official user liaisons) won't admit to, or can't determine what is really important; consequently, they won't back down from anything in the ORD.

ROADBLOCK No. 4

Schedule and cost are not really viewed as requirements in the same way that performance requirements are viewed.



ROADBLOCK No. 5

The mindset that, "Acquisition people don't do requirements and users don't do acquisitions."

ROADBLOCK No. 6

The color and year of money simply make for a lot of waste.

ROADBLOCK No. 7

Requirements for a full-spectrum Operational Test and Evaluation (OT&E) on interim capability acquisitions use up a lot of time and money.

ROADBLOCK No. 8

User buy-in for an EA strategy. Users fear that support for programs will dry up before they get a lot of the capabilities that they need—that the EA approach will be arbitrarily short-circuited.

Paving the Road

As soon as a need is identified, we need to form a program team. This needs to occur as soon as possible after the Mission Needs Statement is completed. The makeup of this team must be distributed between acquisition, test, and user communities. Participation by SAF/AQ may also be needed. This team needs to work on both requirements and market research right away.

The acquisition strategy will also start to flow from the determination of requirements and the current state-of-the-art. Developing the framework ORD is key. An overall acquisition strategy needs to be framed, including a nominal evolution plan (a description of the projected allocations of capabilities and time frame for implementation), an analysis of alternatives, funding profiles through at least several increments of development, and projected contract strategies.

Also needed will be a nominal increment-phased Test and Evaluation Master Plan (TEMP). Following Milestone Decision Authority (MDA) approval, the budget needs to be approved. At this point the program team makeup can change to a more classical acquisition makeup (Figure 1), though the continued heavy involvement of the users would be helpful.

The acquisition process described in this article has addressed Roadblocks 1, 2, 3, and 5. In some sense, Roadblock 4 is also addressed, but only if a proper EA ORD is created—one that properly phases requirements into different acquisition increments. If this takes place, I also believe that Roadblock 7 can also be addressed.

Roadblock 6 is a little different. In fact, this particular problem also exists with the classical acquisition process. The only way to change this "fact of life" is congressional realization and action allowing us to create programs where the entire program budget is set. For this type of program, money is available when it is needed, as opposed to only being available in particular years.

Roadblock 8 is a problem that can probably only be addressed with some program successes using these strategies. Of course, in order to have some successes, the solution is the same as for Roadblock 6. Right now, Roadblock 8 is one of perception, not actuality.

A Notional Program—Needs and Availability

Let us imagine a situation where the users have identified a need for a bio-

FIGURE 2. Evolutionary Increment Capabilities Comparison

Requirement	Increment 1	Increment 2	Increment 3
Collect bio sample	Yes	Yes	Yes
IOC	1 year	5 years	12 years
Bio presence warning	No	Yes	Yes
# of bio agents	N/A	5 (10 obj)	25
time to warn	N/A	30 sec (tradable for # of agents)	15 sec
Remote warning	N/A	Objective	Yes
False Positive	N/A	10%	5%
False Negative	N/A	2%	1%
Volume	100 in ³ (50 obj)	200 in ³ (100 obj)	200 in ³
Weight (including power source)	not specified	15 lb.	10 lb.
Field programmable	N/A	Objective	Yes
MTBM	1 wk	3 days (1 wk obj)*	1 wk
Ruggedness	1% breakage	Same	Same
Silent operation	Yes	Yes	Yes
Collect chem agents & TIMS	Objective	Yes	Yes
Warn of chem agents & TIMS	No	Objective	Yes
Acquisition strategy	Commercial Item Evaluation	R & D Cost Plus	R & D Cost Plus
Runs	Begin Immediately	Concurrent with Increment 1	Follows Increment 2

**The reason that a lower MTBM is allowable from Increment 1 to Increment 2 is that the power sources are required to accomplish a greater number of required tasks.*

logical agent detector. This detector needs to be small enough so it can be clipped onto an individual's belt. Having this detector serves three purposes: 1) it should detect the presence of harmful biological agents, 2) it should warn the wearer of the presence of these agents, and 3) it should capture a sample of the agents (allowing caregivers a method to determine exposure and thus appropriate treatment).

An appropriate team is created. The team then determines the end-state requirements:

- The detector should have a physical volume no greater than 100 cubic

inches (with no dimension to exceed seven inches).

- The weight (including any necessary power sources) shall be no greater than 10 pounds.
- It shall detect and warn of all known biological threat agents (as per a given list) in no longer than 15 seconds (given a certain level of agent present).
- It shall be field programmable to include new threat agents as they are determined.
- It should also allow detection and warning of chemical warfare agents and Toxic Industrial Materials (TIMs).
- Upon detection of agents, it should also provide a warning notification to a remote central site (including Global

Positioning System, or GSP coordinates).

- It shall be capable of operating continuously for one week without any maintenance (including power supply changes).
- It shall have no more than a 5 percent false positive identification, and no more than a 1 percent false negative identification.

These requirements are difficult, but also ones which I would realistically expect the user community to require. The market research for our notional program indicates that several devices are available commercially that have various combinations of the requirements.

Device A can collect samples of biological agents, is well within the cube/weight requirements, and will operate for a week without any maintenance. (In fact, let us stipulate that there are a couple of different brands just like Device A.)

Device B will detect and warn the wearer of a partial list of biological agents (though only at a third of the sensitivity desired). It fits within the cube requirements, but the weight is 15 pounds, and it will only operate for a day before requiring new batteries. The false positive and negative rates are 10 percent and 5 percent respectively.

Device C will detect and warn of the same list of biological agents at the desired sensitivity levels. Its volume is 200 cubic inches and it weighs 18 pounds. It will also last for only a day before it requires new batteries, and the false positive and negative rates are 20 percent and 5 percent respectively

Neither Device B nor C collects samples. None of the devices detect chemical agents or TIMs, and none can send a signal to a remote site. Adding additional agents is limited for Devices B and C, and certainly not in the sense of being field programmable.

A Notional Program—The Alternatives

An analysis of the available data indicates that a Research and Development

(R&D) program to create the desired objective device in a single acquisition would take 10 years and \$35 million. This would be from the time the initial R&D contracts are awarded until the time that all testing is complete, but would not include any production.

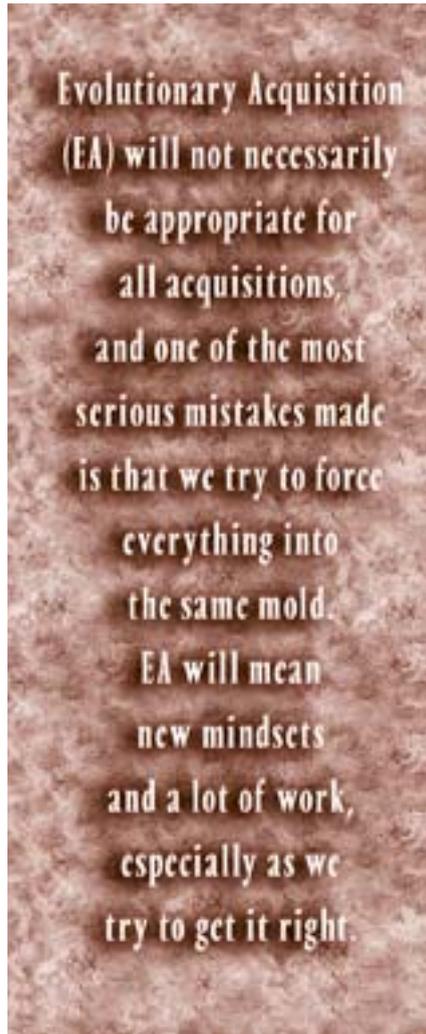
Our notional program would have two phases. At the cost stated, there would be two contracts for the Systems Integration, which would last five years. At that time, a single contract would be let for Systems Demonstration, which would also last five years.

Alternatively, any one of the three available devices could be tested and ready for distribution to the field in as little as a year at a cost of \$1.5 million.

Another alternative would be that the capabilities of Device A could be combined with the capabilities of either Device B or C (perhaps with some minor enhancements) and ready for production in four years at a cost of \$11 million. This would be done with a single contract; adding a second alternative competitor would add no time but would add \$4 million.

A Notional Program—The Evolutionary Acquisition Strategy

The users determine that they want some capability out there as soon as possible, but they also don't want to give up the quest for more capability. After a lot of internal wrangling, they decide that they want to acquire Device A, and they want to start fielding in 10 months.



In fact, because of the current world situation they determine that fairly wide fielding of Device A, within a year's time frame, is absolutely crucial. In five years they want the capabilities of Devices A and C, but are willing to accept three days' continuous operation without maintenance. So an Operational Requirements Document is written.

This ORD is written to an evolutionary strategy in three increments (Figure 2). For the first increment, the KPPs are Initial Operating Capability (IOC) within one year, the ability to collect sufficient biological agents to allow for positive identification for treatment purposes, and one-week continuous operation. Other requirements are a threshold volume of 100 cubic inches (50 desired), sufficient ruggedness so that no more than 1 percent of the items will break given combat battlefield conditions, and silent operation. Collection of chemical agents and TIMs is given as a desired capability.

For the second increment, the KPPs are that the new device must be able to collect sufficient biological agents to allow for positive identification for treatment purposes; the device must warn for the top five listed biological threat agents within 30 seconds (15 seconds and the top 10 biological threat agents listed are desired), and three days' continuous operation (one week desired).

Other requirements include a threshold volume of 200 cubic inches (100 desired), weigh less than or equal to 15 pounds, false positive ID rates no greater than 10 percent, false negative ID rates no greater than 2 percent, and sufficient ruggedness for battlefield operation. IOC is given as five years. Desired capabilities include chemical agent and TIM warning, and remote location signal capability.

A third increment also calls for the requirements as initially identified by the program team and an IOC of 12 years. The funding profiles needed to accomplish these three evolutionary increments are determined and the Program Objective Memorandum (POM) process begun.

The first increment will be a COTS acquisition. The actual acquisition strategy is that this increment will concentrate on testing the capabilities of the available market devices, particularly concentrating on testing those capabilities that the companies haven't already tested. The selected item will then be



CONSEQUENCES OF IMPLEMENTING AN EVOLUTIONARY ACQUISITION STRATEGY

Consequence No. 1 More work is needed up front in the very beginning of the acquisition process, with acquisition strategies and formal market research taking place much earlier in the process.

Consequence No. 2 Acquisition personnel are going to get a lot more involved in determining requirements; conversely, the users are going to have a lot more to say about acquisition strategy.

Consequence No. 3 We will need some sort of operating budget for acquisition a lot earlier than in the past. This might well mean a new budget line item available for this up-front work.

Consequence No. 4 Programs don't necessarily end when we acquire something. That means resources don't get freed up for other activities.

Consequence No. 5 We have to make commitments to a whole plan involving more than a single round of activity. And we have to be serious about that to which we are committing. Once we set the requirements for a particular increment of activity, they are set. No creeping requirements allowed!

Consequence No. 6 MDA decisions will cover a potentially much broader scope than before. That means a lot more work preparing for them, and a new layer of meaning for all involved.

Consequence No. 7 Some activities may have to get used to dealing with less complete data upon which to base their decisions.

Consequence No. 8 The current method of budgeting for specific years needs to go away. Instead, we need to look at the timeframes involved in specific programs and make budgeting decisions appropriate to those programs.

Consequence No. 9 If we are serious about committing resources to a particular program, we have to be serious about doing these programs right—being patient when it is required, but conversely demanding performance when it is appropriate.

Consequence No. 10 We may accomplish a smaller number of programs simultaneously in order to make the commitment necessary for the programs we choose to pursue. Action teams don't exist until too late in the process.

purchased using an Indefinite Delivery, Indefinite Quantity (IDIQ) contract.

At the same time, the acquisition team will begin developing the Request For Proposal (RFP) package for the second acquisition increment. They plan on awards to two different contractors to develop the desired item(s). These will be cost-plus contracts. Production will be a separate contract to either one or both of the contractors, depending upon the success of the program. As soon as

practical after production begins on the second item, the team will begin working on the RFP on the third increment of the requirement evolution.

A Notional Program—Execution

The program is briefed to the MDA and approval is received. Budget is acquired. The best strategy to accomplish the first phase is to solicit items from industry. The Services will purchase sufficient numbers of the different items from the different vendors in order to conduct

testing. Once testing is complete, quotes for an IDIQ contract will be requested from those vendors whose items meet required capabilities. We can then determine the best value between capabilities and cost, and award a single contract to the "winning" bidder. This best value will compare the capabilities to the number of items that can be procured with the budget at hand.

Having worked together, the acquisition team has determined that what needs to be tested most is the field ruggedness of the COTS devices. Also important, though, is the ability of the samples collected to be used to determine medical treatment. The Operational Test Agencies (OTAs) will be responsible for this testing, which will be run as a Limited User Evaluation (LUE). Also examined will be any compatibility issues that the devices have with other gear worn by the users.

Working together, the Services determine that the roughest environment these devices have to face is that of the combat infantryman. So, in order to save time and money, we will conduct this assessment in conjunction with an available Army or Marine Corps exercise.

In order to test the treatment requirement, the OTAs, in conjunction with the DT personnel, arrange for a chamber test where the devices are exposed to realistic levels of battlefield contaminants. The "filled" devices will then be sent to a series of medical pathologists to determine whether the correct contaminant can be identified.

Since it is not critical to the acceptance of the device, separate DT is conducted to determine the capability of the devices to collect chemical warfare agents and TIMs. While this may affect the final determination of what is bought, operational impact is minimal, so the OT testing doesn't address this at all.

A Notional Program—Preparing For Phase II

As testing begins on the first phase, the acquisition team sets to work preparing the solicitation package for the second

phase of the program. Going back to the MDA isn't necessary, since both Phase I and Phase II were part of the original decision. Similarly, when the POM requests went forward, the budgetary requirements for both phases were included. The source selection for Phase II will begin around the time the Phase I purchase decision takes place.

Some Variations on Evolutionary Development

Earlier in this article, I used the term spiral development. The notional program described in this article is that of a spiral development, where a phase is followed by another, and then perhaps another to follow the second (Figure 3). But there are some other things we can do to make EA even more adaptable and capable of accomplishing what we need done.

Overlapping Development

Let's talk about overlapping development (Figure 4), which I often refer to as helical development, because we have concurrent spirals which wrap around each other like the coils of a DNA helix. This is something that we in the acquisition community already do to a degree, but don't necessarily talk about. And again, much of the difference about what we *currently do* as compared to what we *can do* is a matter of commitment and intent.

Let's say that a couple of things might need to be accomplished in order to prepare for a follow-on phase in our EA strategy. Perhaps the next phase requires testing to a sensitivity that we cannot

The current method of budgeting for specific years needs to go away. Instead, we need to look at the timeframes involved in specific programs and make budgeting decisions appropriate to those programs.

yet accomplish, or perhaps requires a test that doesn't exist. Part of the overall strategy for our EA will need to be the development of required testing concurrently with an earlier phase of our program.

Similarly, maybe we need to spur technological development. The specific purpose is different, but the overall intent is the same—to aid an evolutionary phase of the program. Now, we already do this, but what we don't do is to really tie these together as a single strategy. It becomes too easy to cut the R&D program, so when we are "ready" for

our follow-on acquisition we really aren't ready for our follow-on acquisition. And sometimes, although less often, we cut out the acquisition program without effecting the necessary technology or test development when they are perceived as no longer necessary. These things need to be addressed as a holographic whole.

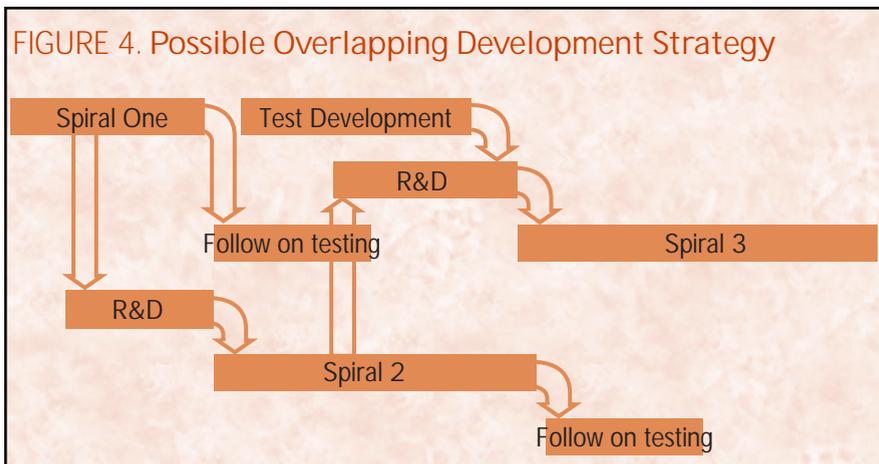
Spiral Testing

Often we test items or capabilities that don't make a difference in our acquisition of a particular item. Now, testing is good. But tests take time and they take up resources. Something we don't take advantage of is that, notionally, there exists follow-on DT and OT. Testing doesn't necessarily have to end when we procure something. When a program is tight on either time or money, why not delay non-decision value-added work until later.

A good example of this was the fairly recent development of the now current-generation protective gear. One operational question was, if this protective gear rips can we slap some hundred-mile-an-hour tape on it and keep going? This wasn't a reasonable fix for the current gear, and wasn't a critical or key performance requirement for the new gear. Therefore, the answer to this question would have no impact whatsoever on any acquisition decision.

This was at a point in the program where cost cutting was getting critical, and tests (which might have made a difference) were getting cut. This particular answer would not only tie up money, but would also tie up a one-of-a-kind chamber, which was needed for other testing. Yet, we could not get one particular element to back off this test. This test, in our new way of thinking, was certainly something important to know from an operations-concept point of view, but should have been conducted as we were buying and fielding the item, not while we were developing it.

Similarly, as programs run across time pressures, maybe we need to realize that full-scale, multi-million dollar operational tests of every system aren't nec-



essary. Perhaps using limited fielding to provide the real-world data for operational assessment is the way to go, or perhaps the correct course is hybrid testing, which involves testing only those items absolutely necessary to address safety and health concerns prior to fielding, and following up with field data on other capabilities later.

Please understand that I am not talking about skimping on necessary testing, either DT or OT. This is a practice that is already too common, and is one that has produced bad results. Dr Philip Coyle III, former Director of Operational Test and Evaluation, Office of the Secretary of Defense, and others have already discussed the results of this practice, so I need not repeat their findings. But, that said, we only want to test those requirements that are appropriate to the goals of the particular phase of a program.

Limited Fielding For Its Own Sake

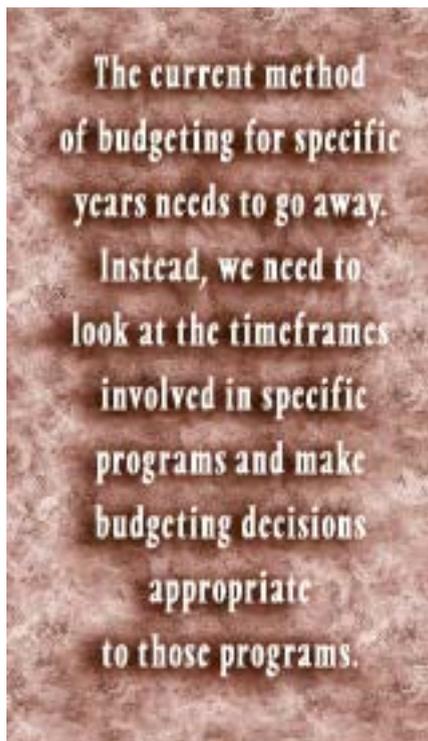
In the preceding discussion, I explained the strategy of using limited fielding for the sake of providing OT data. But say that we are pushing an EA strategy in order to get some type of capability into the field for a critical need. Does everyone need that capability? Perhaps eventually the answer is yes, but that they don't need something in nine months. Perhaps only a certain theater of operation requires something right away, and that a reduced capability is better than no capability in this context. Maybe we can scale the procurement appropriately.

Living with Consequences

Implementing the types of strategies I have discussed won't necessarily be easy. And certainly, specific effects will result from trying to take this type of path. These aren't necessarily bad things, though some people will see them as such. They are simply consequences of the decisions we make, and we need to understand and accept them as such if we are going to make things work better.

CONSEQUENCE No. 1

The first consequence is that more work is needed up front in the very beginning



of the acquisition process, with acquisition strategies and formal market research taking place much earlier in the process.

CONSEQUENCE No. 2

The second consequence follows on from the first and directly addresses Roadblock No. 5. Acquisition personnel are going to get a lot more involved in determining requirements; conversely, the users are going to have a lot more to say about acquisition strategy. A lot of compromise is needed here.

CONSEQUENCE No. 3

The third consequence is also a follow-on from the first. We will need some sort of operating budget for acquisition a lot earlier than in the past. We are no longer talking about vague future planning suitable for planning offices. We are talking about a definitive acquisition strategy, which will take up program office resources. This might well mean a new budget line item available for this up-front work.

CONSEQUENCE No. 4

Consequence No. 4 is that programs don't necessarily end when we acquire something. That means resources don't get freed up for other activities.

CONSEQUENCE No. 5

Consequence No. 5 may be considered by some a different way of saying Consequence No. 4, but I view it as very different. Consequence No. 5 is that we have to make commitments to a whole plan involving more than a single round of activity. And we have to be serious about that to which we are committing.

Once we set the requirements for a particular increment of activity, they are set. No creeping requirements allowed! When it comes to making changes, obviously a nine-month program cannot have the flexibility of a four-year program.

CONSEQUENCE No. 6

Consequence No. 6 follows on from both No. 4 and No. 5; MDA decisions will cover a potentially much broader scope than before. That means a lot more work preparing for them, and a new layer of meaning for all involved.

CONSEQUENCE No. 7

Consequence No. 7 is that some activities may have to get used to dealing with less complete data upon which to base their decisions. But that doesn't mean the data aren't sufficient to make the necessary decisions—it's just that some things matter at certain times and others don't.

CONSEQUENCE No. 8

Consequence No. 8 may not be so much of a consequence as a wish. The current method of budgeting for specific years needs to go away. Instead, we need to look at the timeframes involved in specific programs and make budgeting decisions appropriate to those programs.

CONSEQUENCE No. 9

Consequence No. 9 is contingent on No. 8. If we are serious about committing resources to a particular program, we have to be serious about doing these programs right—being patient when it is required, but conversely demanding performance when it is appropriate.

CONSEQUENCE No. 10

Consequence No. 10 is that we may accomplish a smaller number of simulta-

neous programs in order to make the commitment necessary for the programs we choose to pursue.

Consequences No. 5 and No. 8, when taken together, address the User fears noted as Roadblock 8, earlier in the article. Programs not being allowed to mature to a necessary level will be a real problem if the people and institutions responsible for strategic vision and budget (everyone from agency headquarters staff to Congress) don't have a good understanding of what EA is about and the purposes and goals of the particular program acquisition strategies that will result.

Still a Few Bugs in the System

A few things can still cause us to stumble. The biggest problem is the time necessary to get the money for these programs into the POM cycle. A sufficiently

large wedge placed in the POM as soon as a need is identified will help matters. However, we have to realize that when we place that wedge in the POM, it isn't going to be even a SWAG (*Sophisticated Wild A - - - Guess*).

For that reason, teams need to have freedom to adjust that amount when planning is sufficiently far along. And, unless the budgeting cycle can adjust to the changes in a reasonable amount of time, we are going to be attempting to accomplish things without the proper resources. Because of Consequence No. 10, having too much money set aside as a wedge may be as big a problem as having too little.

Another problem is that we will be developing acquisition strategy prior to completing the ORD. This is really just a consequence, as opposed to a stum-

bling block. But if we cannot overcome the mindset that we need firm requirements before creating an acquisition strategy, we could seriously impact the capacity that EA has to reduce the time needed to field items.

Evolutionary Acquisition holds a lot of promise. It will not necessarily be appropriate for all acquisitions, and one of the most serious mistakes made is that we try to force everything into the same mold. EA will mean new mindsets and a lot of work, especially as we try to get it right. The first few efforts may easily fail, but commitment and innovation will eventually make it worth the effort and frustration.

Editor's Note: Slate welcomes questions or comments on this article. Contact him at alex.slate@brooks.af.mil.

IN MEMORIAM

Charles Joseph "Chuck" Tringali

The Defense Acquisition University has received word of the death of Charles Joseph "Chuck" Tringali on March 20. Chuck was past president of the Defense Systems Management College Alumni Association (DSMCAA, now DAUAA) and an active participant in DAU-DSMC activities for many years.

A retired Air Force colonel and recipient of the Distinguished Flying Cross, Chuck commanded and made operational the first nuclear-armed "Thor" ICBM missile site in the United Kingdom; and completed 149 combat missions in Southeast Asia as a Command pilot flying highly classified unarmed reconnaissance aircraft. Chuck was also team leader



of the flight crew for Project Apollo. He later produced the initial concept documents and helped to start the Space Shuttle Office at the Pentagon.

A former executive of Lockheed Martin Corporation, Chuck served as Senior Director, Intelligence Group, Space and Strategic Missiles Sector, Washington Operations. He was a graduate of DSMC's Program Management Course (PMC 76-2), and was the first recipient of the DSMCAA David D. Acker Award for Skill in Communication in 1992.

Chuck was interred at Arlington National Cemetery April 15. He is survived by his wife of 42 years, his son, daughter, and two grandchildren.

DAU Opens Mid-Atlantic Region in Patuxent River, Md.

Taking Education Directly to the Workforce

SYLWIA GASIOREK-NELSON

Continuing its goal of transformation in acquisition training by providing products, services, and reorienting campuses where the acquisition workforce is highly concentrated, the Defense Acquisition University (DAU) opened its Mid-Atlantic Region at Patuxent River, Md., March 20. The official ribbon-cutting ceremony, hosted by Army Col. (P) James R. Moran, former DAU Commandant, Fort Belvoir, Va.; Navy Vice Adm. Joseph “Joe” Dyer, Commander, Naval Air Systems Command; and Barbara Smith, Dean, DAU Mid-Atlantic Region, took place at Patuxent River on April 10.

Welcome

In one of her first public appearances as dean of the new region, Smith welcomed government-industry customers from the Mid-Atlantic Region; colleagues from DAU; and representatives from St. Mary's College, College of Southern Maryland, the local Chamber of Commerce, and St. Mary's County. Smith also recognized distinguished guests participating in the day's events: Donna Richbourg, Director, Acquisition Initiatives, Office of the Secretary of Defense; William Hauenstein, Director, Navy Acquisition Career Management; Moran and Dyer.

Smith emphasized that this event marks the continuation of a long and lasting relationship between the University and the major acquisition activities in the Mid-Atlantic Region.

“With our continued presence in both the Norfolk and Petersburg areas,” said Smith, “and the stand-up of those state-of-the-art facilities for our customers, including the Naval Air Systems Team, we are positioned to provide world class training and support where and when it is needed.

“This is a dramatic step for transformation of the DoD acquisition workforce,” she emphasized. “DAU Mid-Atlantic Region will be the keystone for acquisition education and performance support to provide sustained acquisition excellence within Defense Acquisition commands located within our five-state area. This is an exciting challenge as the workforce continues to evolve at a rapid rate with a large influx of new employees anticipated over the next few years.”

In the Foxhole

Introducing the first guest speaker, Smith welcomed Moran, whom she referred to as “the driving force behind the implementation of the DAU transformation.”

“This a great day for the Mid-Atlantic community, DAU, and the Navy,” Moran said. “Our intention is to try to regionalize and stand up five major campuses. We're four of five now, and it's a tremendous achievement. We have one more left in California—coming later this year,” he said.

With the new regional scheme, Moran said that DAU was now “in the foxhole

with the customers,” and by being a part of the community, DAU is able to provide more relevant products and services.



Gasiorek-Nelson is a full-time contract editor for Program Manager Magazine. She is employed by SRA International, Inc.

"We're becoming a part of the Patuxent River and Navy community, and it's a great achievement for all of us at DAU. Thank you all for coming, and we're looking forward to serving the workforce in the DAU Mid-Atlantic Region," he concluded.

Attempting Our Future

Dyer, who served as guest speaker for the ceremony, has long been associated with the Navy's Acquisition Workforce, supporting development and professional growth. He told the audience that there is a direct link between acquisition, technology, logistics, research and

development, test and evaluation, and delivery of "winning warfighting."

Looking to the future, Dyer said that we now have growing up today in this country, from ages 9 and 10, a set of people who are going to be well skilled in distance learning and well skilled in modeling and simulation.

Traditional Ribbon Cutting at the DAU Mid-Atlantic Region opening ceremony, Patuxent River, Md., April 10, 2002. Pictured from left: Dave Scibetta, DAU Deputy Director, Operations; Navy Vice Adm. Joseph "Joe" Dyer, Commander, Naval Air Systems Command; Barbara Smith, Dean, DAU Mid-Atlantic Region; Army Col. (P) James Moran, former DAU Commandant; and Donna Mason, Director, Resource and Administration, DAU Mid-Atlantic campus.

Photo by Army Sgt. Kevin Moses



"[They] are going to be a jump ahead of the rest of us in terms of managing programs and managing undertakings that are so important to our security in this nation, and so important in the role we play the world over."

Dyer said that he finds it exciting to see not only the great classrooms of the Patuxent facility, but also what's being done in terms of reaching out and in terms of extended learning.

"We are genuine and four-square standing in terms of our support and our input of greater numbers of people into this institution," he said.

Underscoring the importance of DAU's new facility, Dyer said, "It's where we train and attempt our future. It's where we'll draw upon not only for training into the future, but we expect to draw upon people with current and ongoing programs to have the kind of expertise that we would find at the Fort Belvoir campus. To find such expertise here, locally, is a wonderful thing."

Concluding his remarks, Dyer said, "Thank you for recognizing Pax River's role in the acquisition process. Thank you for coming here today. It's going to be a great association and we're looking forward to it."

Cottonwood Building

The Mid-Atlantic campus consists of 44 staff and faculty members, who will focus not only on teaching but also on research and performance support. Their agenda includes working with local offices and staying current on major issues and needs of the acquisition workforce throughout that regional area, which has approximately 30,000 acquisition personnel.

The DAU Mid-Atlantic facility will offer the new six-week Program Management Office Course (PMT-352), replacing the former 14-week Advanced Program Management Course (PMT-302) as the Level III PM Certification Course, as well

Patuxent River, Md., Location Ideal for DAU Mid-Atlantic Region

"With our continued presence in both the Norfolk and Petersburg areas, and the stand-up of those state-of-the-art facilities for our customers, including the Naval Air Systems Team, we are positioned to provide world-class training and support where and when it is needed."

—Barbara Smith
Dean, DAU Mid-Atlantic Region
April 10, 2002



DAU Mid-Atlantic campus.



Barbara Smith, Dean, DAU Mid-Atlantic Region, welcomes guests to the Mid-Atlantic Region opening ceremony.

Navy Vice Adm. Joseph "Joe" Dyer, Commander, Naval Air Systems Command.



Dyer, Smith, and Keynote speaker, Army Col. (P) James Moran, former DAU Commandant.



Army Col. Ronald Flom, new DAU Commandant, and Smith review DAU Mid-Atlantic campus curricula.



From left: Moran; Smith; Donna Richbourg, Director, Acquisition Initiatives, Office of the Secretary of Defense; and Flom.

One of the new classrooms within the Cottonwood Building, DAU Mid-Atlantic Region, Patuxent River NAS, Md.



Team DAU Mid-Atlantic.



MID-ATLANTIC REGION

Barbara Smith was named Dean, DAU Mid-Atlantic Region, Patuxent River Naval Air Station, Patuxent River, Md., effective Sept. 24, 2001. Prior to joining DAU, Smith was the V-22 "Osprey" Deputy Program Manager at Naval Air Systems Command (NAVAIR), Patuxent River. Smith began her federal career as a Reliability Engineer on avionics and propulsion systems for the F-18 A/B program at NAVAIR. In 1978, she moved to Sikorsky Aircraft Company and helped develop the LAMPS Mark III Life Cycle Cost program, followed by an assignment as Proposal Manager for the SH-60F helicopter. Returning to NAVAIR, she spent five years in the AV-8B Program (PMA-257), guiding the development and transition of the AV-8B for the U.S. Marine Corps Fleet Marine Force.



extending its classroom capabilities through the establishment of regional campuses nationwide. Stepping forward and taking advantage of the new technology, DAU is fulfilling its goal and vision of providing continuing education and distance learning that meet the immediate needs of the acquisition professionals where they need it most—in the workplace.

The opening of the DAU Mid-Atlantic campus is the continuation of the DAU transition process, which started with the opening of the DAU South Region campus in Huntsville, Ala., to increase the staff and

faculty where the acquisition workforce is more visibly located.

The transition and reorganization of the University focuses on having five regions located at places where the workforce is concentrated: DAU Capital and Northeast Region, Fort Belvoir, Va.; DAU Midwest Region, Wright-Patterson Air Force Base, Ohio; DAU South Region, Huntsville, Ala.; DAU Mid-Atlantic Region, Patuxent River NAS, Md.; and DAU West Region, San Diego, Calif. (coming later in 2002).

Editor's Note: For more information on the Mid-Atlantic Region, view their Web site at <http://www.almc.army.mil/DAU/>.

as a wide variety of business and technical courses, including Systems Engineering and Production courses available to military and civilian personnel within the Department of Defense. Current plans are to provide 70 to 80 weeks of instruction per year.

The DAU Mid-Atlantic Region campus is located at 23330 Cottonwood Parkway, California, Md. DAU will be among one of the first tenants of the brand-new building, will occupy 12,000 square feet of this first-class facility, and will be fully prepared to accommodate student needs. The facility also contains classrooms furnished with state-of-the-art equipment and furniture to enhance the students' learning experience. The new location, set in a beautiful wooded area, also offers a fitness center, excellent parking, and a new lounge with dining facilities.

DAU Regional Transition Process
In the face of a constantly changing and evolving acquisition workforce, DAU is

APMC 02-1 Class Gift Goes to Army Emergency Relief 9-11 Fund



Each graduating class of the Defense Acquisition University's Advanced Program Management Course (APMC) typically leaves behind a lasting gift to the University. APMC 02-1 departed from that tradition for a very worthy cause. Senior APMC Section Leader, Navy Capt Paul R. Zambito (center) is holding a check for \$1,040—a gift from APMC 02-1 to the Army Emergency Relief (AER) 9-11 fund. Pictured with Zambito are DAU Commandant, Army Col. Ronald Flom (left) and Dave Fitch, Dean, Defense Systems Management College-School of Program Managers. Students of APMC Class 02-1 graduated from the 14-week course on April 19. (After the check was cut, the class received another \$24 in donations—also turned over to AER—bringing the total gift to \$1064.) Photo by Army Sgt. Kevin Moses

Fourth Annual International Acquisition/Procurement Seminar—Pacific (IAPS-P)



September 23-26, 2002

Sponsored jointly by the
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Seminar Registration Information

The Fourth Annual International Acquisition/Procurement Seminar—Pacific (IAPS-P) focuses on international acquisition practices and cooperative programs. The seminar is sponsored by defense educational and related institutions in the United States, Australia, South Korea, and Singapore.

The seminar will be held Sept. 23-26, 2002, at DAU-DSMC, Fort Belvoir, Va.

Those eligible to attend are Defense Department/Ministry and defense industry employees from the four sponsoring nations who are actively engaged in international defense acquisition programs. Other nations may participate by invitation. Pacific Rim (PACRIM) nations participating in previous seminars were Canada, Japan, New Zealand, and Thailand.

The IAPS-P is by invitation only. Those desiring an invitation who have not attended past seminars should fax DAU-DSMC a letter of request, on government or business letterhead, to (703) 805-3175.

If you have attended a past seminar, you can register by going to our Internet Web site at <http://www.dsmc.dau.mil/international/international.htm>. **Qualified participants pay no seminar fee.** Invitations, confirmations, and administrative instructions will be issued after May 1, 2002.

Contact a seminar team member for additional seminar information at:

Comm: (703) 805-5196

E-mail:

internationalseminars@dau.mil

DAU Strategic Partnerships Increasing Daily

Memorandum of Agreement Signed Between DAU and Committee for Purchase From People Who Are Blind or Severely Disabled

ANNMARIE HART-BOOKBINDER

FORT BELVOIR, Va. (March 22, 2002)—In an effort to provide state-of-the-art online education and training to the defense acquisition community while maximizing federal agency awareness of products and services provided by people who are blind or have other severe disabilities under the Javits-Wagner-O'Day (JWOD) Act, the Defense Acquisition University (DAU) signed a Memorandum of Agreement (MOA) today with the Committee for Purchase From People Who Are Blind or Severely Disabled, the Federal agency that administers the JWOD Program.

Signatories of the Agreement were Rita Wells, Ph.D., Deputy Executive Director of the Committee staff, and Frank J. Anderson, Jr., President, DAU.

This Agreement details a Committee staff employee to DAU to assist with e-Learning curricula. This will enable DAU to enhance and update training references and information on the requirements of the JWOD Program as authorized by the Federal Acquisition Regulation (FAR). DAU has also agreed to assist the Committee in building a continuous JWOD learning course to be hosted by DAU.

For both DAU and the JWOD Program, which have supported each other's initiatives in the past, this Agreement provides an important new partnering op-



Dr. Rita Wells, Deputy Executive Director, Committee for Purchase From People Who Are Blind or Severely Disabled, and DAU President Frank J. Anderson Jr., sign a Memorandum of Agreement on March 22, 2002, at DAU Headquarters, Fort Belvoir, Va. Their agreement will promote state-of-the-art online education and training for the Defense acquisition community while maximizing Federal agency awareness of products and services provided by people who are blind or have other severe disabilities under the Javits-Wagner-O'Day (JWOD) Act.

portunity to meet common acquisition education goals. For DAU, a new e-Learning curriculum will provide its end

users across the globe with access to the training they need when they need it. For the JWOD Program, inclusion in

Hart-Bookbinder is a Public Affairs Specialist, Office of the Committee for Purchase From People Who Are Blind or Severely Disabled.



Also attending the signing ceremony are staff and faculty from DAU and the Committee for Purchase. Seated from left: Wells; Anderson. Standing from left: Myrna Bass, Curricula Development Support Center (CDSC), DAU; Michael Barclay, Committee for Purchase; and Luis Ramirez, CDSC, DAU.

DAU's curriculum will provide the greatest number of Defense Acquisition personnel with the information they need to find JWOD solutions to their product and service needs.

With the unemployment rate for Americans with severe disabilities holding steady at over 70 percent, partnerships with federal agencies such as DAU are crucial to the JWOD Program as it strives to create new employment opportunities for Americans who are blind or have other severe disabilities on Federal product and service contracts.

For more information on the JWOD Program, visit www.jwod.gov. For more information on DAU, visit www.dau.mil.

Send Us Your Suggested Research Topics

The Defense Acquisition University (DAU) is soliciting input from the Acquisition, Technology and Logistics (AT&L) workforce for suggested research topics or issues to assist the AT&L workforce in achieving their short- and long-range mission goals and objectives. If you have a suggested research topic, please contact Dr. James Dobbins, DAU Director of Research (jim.dobbins@dau.mil), or call 703-805-5416.

Latest USD(AT&L) Management Initiatives Now Online

The latest Acquisition, Technology and Logistics (AT&L) Management Initiatives are now posted to the Director, Acquisition Initiatives Web site. View or download them from the following Web site:

<http://www.acq.osd.mil/ar/ar.htm#publicreleasegoals>

These initiatives support the five goals announced by the Under Secretary of Defense (Acquisition, Technology and Logistics) in June 2001:

- Establish the credibility and the effectiveness of the acquisition and logistics support process.
- Revitalize the quality and the morale of the Acquisition Workforce.
- Improve the health of the industrial base.
- Rationalize the weapon systems and infrastructure that will support the new Transformation strategy being developed by the Department.
- Initiate those high-leverage technologies that provide the warfighting capabilities and strategies of the future.

NOTICE

The PEO/SYSCOM Commanders' Conference presentations are no longer linked to the Defense Systems Affordability Council (DSAC) Web site. Presentations from the Oct. 23-25, 2001, conference can now be downloaded from the Director, Acquisition Initiatives Web site at <http://www.acq.osd.mil/ar/peconf2001.htm>.

Team Deepwater and DAU Form Strategic Partnership

Cooperation Key to Meeting 21st Century Acquisition Challenges

STEVEN COHEN

The Coast Guard is entering one of the most exciting times in its rich history. Since it was founded more than 200 years ago, the Coast Guard has proven itself to be one of the most effective and efficient government agencies, playing a critical role in protecting our national security, preserving the maritime environment and providing for maritime safety.

The Integrated Deepwater System (IDS) program is the solution to one of today's biggest problems in the Coast Guard—our aging and increasingly obsolete fleet of cutters and aircraft. These “deepwater” assets are approaching the end of their service lives and need to be replaced in order for us to effectively conduct our 14 federally mandated missions. The IDS will replace 91 cutters and 206 aircraft with a state-of-the-market, interoperable system of assets, as well as supporting command, control, computers, communications, intelligence, surveillance and reconnaissance (C4ISR) and integrated logistics infrastructure.

The Commandant of the Coast Guard has identified the Deepwater program as the Coast Guard's No. 1 priority, making it the largest and most comprehensive re-capitalization effort in Coast Guard history. While the men and women who serve in the Coast Guard are talented and dedicated, they lack the proper tools to perform today's missions effectively and efficiently. The IDS will change that, but it is a formidable task.

DAU President Frank Anderson Jr. (right) and Navy Vice Adm. Timothy W. Josiah, Chief of Staff, U.S. Coast Guard, sign a Memorandum of Understanding (MOU) on March 19, 2002, formalizing a partnership to establish the Coast Guard's Integrated Deepwater System (IDS) Program as a Learning Organization. During the actual signing, Josiah quickly contributed his signature and waited expectantly for Anderson to finish signing his own. Commenting on the delay, Anderson said that his slow signature should not in any way be equated with future performance standards. “To be perfect too late or too early isn't any good ... It's our obligation to provide the right product at the right time.”

Photo by Army Sgt. Fahim Nassar



The Deepwater program is not only the largest acquisition ever undertaken by the Coast Guard, it is also the most innovative. Instead of opting for a one-for-one replacement of these cutters and aircraft, we adopted a cutting-edge, performance-based acquisition strategy that gave three industry teams unprecedented flexibility in designing a system of integrated, interoperable assets.

The Deepwater program will use commercial and military technologies to develope the IDS at the lowest total own-

ership cost. Performance-based acquisitions of this type are consistent with the Government Performance Results Act and Office of Management and Budget policy on Performance Goals and Management; yet few, if any, have ever been initiated of this breadth and complexity.

DAU & the Coast Guard— The Next Step

We have recently entered into an agreement which will help us meet this challenge. On March 19, the Coast Guard

Cohen is Deputy Program Manager and Technical Director, Integrated Deepwater System Program, U.S. Coast Guard Headquarters, Washington, D.C. Also contributing to this article was Christina Cavoli, a freelance writer on contract to Program Manager magazine.

and the Defense Acquisition University (DAU) signed a Memorandum of Understanding (MOU) regarding Integrated Deepwater System program support.

DAU President Frank J. Anderson, Jr., and Navy Vice Adm. Timothy W. Josiah, Chief of Staff, U.S. Coast Guard, represented their organizations in the signing ceremony, held at DAU Headquarters, Fort Belvoir, Va. Anderson stated that the partnership promised a “fantastic future” for both organizations,



Artist rendition illustrating future possibilities for Deepwater and the Coast Guard.

Image courtesy Integrated Deepwater System Program Office

while Josiah added that the organizations were creating a “new partnership preceded by a long history,” noting that every person attending the signing ceremony from the Coast Guard was a DAU alum, having attended at least one resident course at the University.

A Learning Organization

While DAU has been an important source of expertise in the development of our acquisition strategy and has provided exceptional training for Deepwater personnel in the past, this MOU takes our relationship to the next step. It establishes the Coast Guard's Integrated Deepwater System (IDS) program as a Learning Organization, modeled after the Center for Organizational Learning of the Massachusetts Institute of Technology's Sloan School of Management. It also formalizes a cooperative role that

is designed to better leverage the two organizations' capabilities. The resulting synergy will enable the Coast Guard to better meet the demands of the 21st century.

A Learning Organization (LO), a phrase coined by Peter Senge in his book *The Fifth Dimension*, is an organizational concept that builds a framework to capture institutional knowledge across an entire organization, as well as providing a map for continuous improvement and refinement. LOs start with the assumption that learning is valuable, continuous, and most effective when shared and that every experience is an opportunity to learn.

Establishing a long-term partnership with DAU allows the Coast Guard to benefit from the resident talents and expertise within DAU. DAU will use its educational and other resources to make the IDS Program a Learning Organization by consulting with the IDS organization, assessing strengths and areas of potential improvement, and providing the performance support required to effect this goal.

Deepwater—A Leading-Edge Acquisition Strategy

The Commandant of the Coast Guard tasked the Deepwater program (formally established on Aug. 26, 1996) with being “bold and aggressive” in our acquisition approach. Business as usual would not allow us to build the complementary, interoperable system of Surface, Air, and C4ISR assets the Coast Guard needs to meet the challenges it faces. Although we knew our use of a leading-edge acquisition strategy would entail breaking new ground, we worked closely with numerous acquisition experts from academe, government (including DAU), and industry during the course of the program to ensure a sound approach. A comprehensive risk man-

agement strategy was developed that identified and analyzed key elements of risk, and appropriate mitigation strategies were implemented. The Deepwater acquisition approach includes several important features:

System Performance Specification

Rather than providing industry teams with asset specifications, we provided

The Integrated Deepwater System (IDS) program is the solution to one of today's biggest problems in the Coast Guard—our aging and increasingly obsolete fleet of cutters and aircraft.

them with capability specifications for our global Deepwater missions. The only required asset was a National Security Cutter, which was needed to meet our National Fleet obligations to the U.S. Navy. Focusing on capabilities enables industry to use both proven and new technologies to design an interoperable, integrated system capable of executing the Deepwater missions.

Built-in Interoperability

Existing “deepwater” assets lack the ability to operate with each other and with other armed services. Deepwater will

help guarantee interoperability with other Coast Guard assets and Service branches from the beginning because it is a system-wide replacement program.

Two-Phased Approach

The Deepwater acquisition strategy consists of two phases. During Phase 1, three industry teams developed their Deepwater System solutions as functional designs. These teams were then allowed to participate in a limited competition for the development of the refined Integrated Deepwater System proposals in Phase 2. Phase 2 proposals are being evaluated based on four factors: operational effectiveness, total ownership cost, management capability, and technical feasibility.

Communications

Industry is a partner with whom we must communicate and share information to develop the optimal system of assets. Therefore, we established several innovative mechanisms to facilitate communication.

MATRIX PRODUCT TEAMS (MPTs)

Individual MPTs were set up for various technical specialties during Phase 1 of the Deepwater program. Designed to facilitate effective communication between the Coast Guard and industry, the MPTs were made up of experts who assessed the programmatic impacts and technical feasibility of industry's evolving concepts and deliverables.

TECHNICAL ASSESSMENT TEAMS (TATs)

TATs worked with industry during Phase 1 to review designs and exchange information. These teams met regularly with industry to remain current on their progress and better understand their concepts for the program.

INTEGRATED PRODUCT TEAMS (IPTs)

IPTs will replace Matrix Product Teams during Phase 2 of the Deepwater program. Coast Guard IPTs employ experts in different functional areas from across Coast Guard organizations to complete specific tasks. This cross-directorate and industry collaboration helps leverage our expertise. The IPTs have been del-

egated significant authority to make decisions and complete their tasks. This is consistent with our commitment to empower individuals to perform their jobs well.

INTEGRATED PRODUCT DATA ENVIRONMENT (IPDE)

IPDE is the technological component of Deepwater program/industry cooperation. The IPDE provides real-time data connectivity with industry members. This enables the sharing of engineering data, cost estimates, and program management information with industry, ensuring that design changes are made as early as possible and that costs are accounted for accurately.

Deepwater's Progress

Phase 1 of the Deepwater acquisition strategy was completed on June 15, 2001, with the three competing industry teams completing functional designs for their integrated solutions. The Phase 2 Request for Proposals for system implementation was released on June 29, 2001, and proposals were received Sept. 27-28. The Coast Guard is currently reviewing the proposals and the contract is scheduled for award in the third quarter of fiscal 2002.

President Bush and the Department of Transportation have demonstrated their strong support for the program—the fiscal 2002 budget for Deepwater was \$320.19 million, and the President's fiscal 2003 request is \$500 million (\$469 million will be applied to the actual contractual funding for the acquisition of Deepwater assets; \$31 million will be spent on technical support/program management and administration). The outlook for the unmitigated success of the Deepwater program has never been better.

Benefits of Partnership

The partnership between the Coast Guard and the Defense Acquisition University has been mutually beneficial, but the relationship will become even more important following contract award. DAU will continue to provide an invaluable source of acquisition expertise for the Deepwater program, as the Coast

Guard continues blazing a path of acquisition excellence. A closer relationship with DAU, including improved access to their considerable consulting and educational talent, will help us meet this commitment as new issues arise.

This relationship will also create a real-world laboratory for DAU. Through involvement in, and real-time access to Deepwater's leading-edge acquisition activities, DAU experts will be able to capture "lessons learned" from the program for the development of instructional materials and research papers. Members of Team Deepwater will also support DAU by serving as guest speakers, panel members, or workshop leaders for appropriate DAU programs and courses.

The insights gained from this partnership will not only provide tremendous benefit to both Deepwater and DAU, but they can also positively influence future acquisition policy. This is important because sound acquisition strategies will be critical for military transformation. The transition from a platform-centric to a network-centric military, for example, will not happen without innovative acquisition strategies and practices.

An Important Step Forward

The MOU between the Coast Guard and DAU marks an important step forward in a long and rewarding relationship between the two organizational entities. Drawing on DAU's pool of expertise will help us continue the implementation of our leading-edge acquisition strategy and allow the Coast Guard to continue to serve the American public at the level they have come to expect. The Coast Guard will benefit. DAU will benefit. The Acquisition community will benefit, and the American people will benefit. It's a combination that only makes sense.

Editor's Note: The U.S. Coast Guard Integrated Deepwater System (IDS) Program Team welcomes questions or comments on this article. Contact Kerr at PKerr@comdt.uscg.mil.

DAU AND UNIVERSITY OF PHOENIX ONLINE FORM STRATEGIC PARTNERSHIP

Lisa Johnson

On Dec. 11, 2001, the Presidents of both the Defense Acquisition University and the University of Phoenix formally signed an articulation agreement. This agreement to partnership is designed to facilitate the transfer of American Council on Education (ACE) credit recommendations or other credit bearing transcribed courses earned by the Acquisition, Technology and Logistics workforce into a Bachelor of Science in Management degree program at the University of Phoenix Online.

Students may chose from one of four tracks as the emphasis for the degree program: Information Systems Acquisition, Financial Management/Cost Estimating, Contract Management, or an interdisciplinary focus in Acquisition Management.

DAU students may apply up to 30 hours of DAU course work toward the 120-semester-hour requirement. Of the remaining 90 semester hours, the student must take 30 hours from the University of Phoenix, either online or at a campus site, and 60 hours can be

taken at the University of Phoenix or other accredited institutions.

For further information please contact:
Nancy Cervasio (University of Phoenix, Student Services Questions)
(602) 387-6279

Vince Grell (University of Phoenix, Enrollment Questions)
(602) 387-6231

DAU Transcripts
<http://dau.mil/registrar/transcripts.htm> or 1-888-284-4906



Seated, from left: Frank Anderson, President, Defense Acquisition University; and Craig Swenson, Provost/Senior Vice-President, University of Phoenix. **Standing, from left:** Brian Mueller, Chief Operating Officer, University of Phoenix Online; Russ Paden, Regional Director of Academic Affairs, University of Phoenix Online; Wallis Stemm, Director of Articulation & College Relationships, University of Phoenix, University Services; and Tony Digiiovanni, CEO University of Phoenix Online.

Photo courtesy Ben Arnold Photography

DEFENSE ACQUISITION UNIVERSITY, FEDERAL ACQUISITION INSTITUTE SIGN MEMORANDUM OF AGREEMENT FOR JOINT USE OF E-LEARNING VERSION—BASICS OF CONTRACTING (CON-101) COURSE

On March 15, DAU President Frank Anderson Jr.; David Drabkin, Deputy Associate Administrator for Acquisition Policy, General Services Administration; and Gloria Sochon, Director of the Federal Acquisition Institute (FAI), signed a Memorandum of Agreement (MOA) between DAU and FAI.

The MOA is a foundation for the joint use by both Department of De-

fense and civilian agency students of the e-Learning version of the Defense Acquisition Workforce Improvement Act (DAWIA) Level I course for certification in the Contracting career field—CON-101.

The ultimate goal is to ensure that training throughout the federal sector in the field of contracting satisfies a uniform set of required competencies recognized by all agencies and is delivered

in a manner suited to the demands of the 21st century acquisition environment. Piloted and completed in January using both DoD and civilian agency students, the course is now available for registration to all students.

DAU offers several online classes servicing the acquisition community. For a complete listing of DAU courses or to download a complete DAU course catalog in PDF format, visit DAU's Virtual

Campus at <https://dau3.fedworld.gov/dau/index.htm>. Students may also enroll in CON-101 through the Federal Acquisition Institute Online University Web site at http://www.faionline.com/kc/login/login.asp?kc_ident=kc0001.



From left: David Drabkin, Deputy Associate Administrator for Acquisition Policy, General Services Administration; DAU President Frank J. Anderson Jr.; and Gloria Sochon, FAI Director, sign a Memorandum of Agreement, March 15, 2002, for the joint use of DAU's e-Learning CON-101 course.

DAU AND HOWARD UNIVERSITY SCHOOL OF BUSINESS FORM STRATEGIC PARTNERSHIP

On March 15, Frank Anderson Jr., Defense Acquisition University (DAU) President, and Dr. Charles Mahone, Director, Howard University School of Business M.B.A. Program, signed a Letter of Intent chartering DAWIA-certified DAU students for acceptance in the Howard University School of Business M.B.A. degree program, with a concentration in Supply Chain Management and Supply Chain Management certificate programs.

The purpose of this strategic partnership is to leverage capabilities of the parties to create continuous learning opportunities, thereby increasing the skills, knowledge, and abilities of the DoD Acquisition, Technology and Logistics workforce. DAU students will be able to leverage completed DAU training and take Howard University School of Business courses toward an M.B.A. degree.



Dr. Charles Mahone, Director, Howard University School of Business M.B.A. Program (left), and DAU President Frank J. Anderson Jr.

MWC PRESIDENT, DAU COMMANDANT SIGN AGREEMENT RATIFYING STRATEGIC PARTNERSHIP

Christine Neuberger

FREDERICKSBURG, Va. (April 11, 2002)—The Commandant of the Defense Acquisition University (DAU) traveled to the James Monroe Center (JMC) for Graduate and Professional Studies at Mary Washington College Thursday, April 11, to sign an agreement affirming a strategic DAU-JMC partnership fostering the continuing education of the Department of Defense acquisition workforce.

The DAU Commandant, Army Col. Ronald C. Flom, toured JMC in Stafford County and met with MWC President William M. Anderson Jr., to sign a Memorandum of Understanding between the two institutions that underscores JMC's commitment to help meet increasing demands for educational programs in contracts and procurement management.

"I look forward to a long and rewarding relationship," Flom said.

"We, too, are very excited about this new arrangement," Anderson added. "It's great for us. It's great for both organizations. I'm sure it'll open up lots of new opportunities for our two organizations."

DAU, headquartered at Fort Belvoir, provides training and courses for the more than 140,000 military and civilian members of the Defense Department's Acquisition, Technology and Logistics (AT&L) workforce. The DAU delivers its training via campuses scattered around the country, including one at Fort Belvoir.

As part of the agreement with DAU, JMC will expand the AT&L workforce's educational opportunities by recognizing certain required DAU courses as transferable into JMC's Contracts and Procurement Management programs.

By applying credit from DAU courses deemed equivalent to certain JMC courses and those recommended by the American Council on Education, DAU students can leverage DAU training to earn JMC's Post-Baccalaureate Certificate in Contracts and Procurement Management or JMC's Master of Business Administration degree with a Contracts and Procurement Management concentration. The arrangement is available to any defense AT&L worker who meets certain criteria, including JMC admission requirements.

"This partnership is a win-win situation for all parties—DAU, JMC, businesses, students—that helps meet the need for qualified personnel in the contracts and procurement management area," said Dr. Alan G. Heffner, Professor of Leadership and Management and Director of JMC's M.B.A. Program.

JMC's Contracts and Procurement Management programs began in fall 2001 to open career opportunities to professionals seeking to enter the field and to help professionals now employed in the field to advance, as well as to help meet public and private sector needs for quality education in contracts and procurement management.

There is growing demand for procurement professionals trained to get the best value for contract spending in government and industry. Private and public sectors increasingly rely on contracting out for the delivery of goods and services or for hiring contractors. Meanwhile, organizations providing contracted services must employ skilled procurement professionals to compete for and deliver high-quality products and services on time and within budget.

JMC's mission is to support regional economic development, personal lifelong learning, and professional advancement through quality full-time and part-time educational programs and services. The center offers baccalaureate degree completion, post-baccalaureate and graduate certificates, and master's degrees, as well as professional certification and re-certification programs, individual professional development courses, and continuing education. Classes and services are available during the evening, on weekends, and during normal weekday business hours to meet the needs of working adult students.

For more information about JMC's programs, call (540)286-8000; call toll-free (888) 692-4968; or visit the JMC Web site at <http://www.jmc.mwc.edu>. To learn more about DAU or review a list of resident and online courses, go to <http://www.dau.mil>.

Aldridge Publishes Definitions for Evolutionary Acquisition, Spiral Development



THE UNDER SECRETARY OF DEFENSE
3010 DEFENSE PENTAGON
WASHINGTON, D.C. 20301-3010

APR 12 2002



MEMORANDUM FOR SECRETARIES OF THE MILITARY DEPARTMENTS
CHAIRMAN OF THE JOINT CHIEFS OF STAFF
UNDER SECRETARIES OF DEFENSE
INSPECTOR GENERAL, DEPARTMENT OF DEFENSE
GENERAL COUNSEL, DEPARTMENT OF DEFENSE
DIRECTORS OF THE DEFENSE AGENCIES

SUBJECT: Evolutionary Acquisition and Spiral Development

Since the publication of DoD Directive 5000.1 and DoD Instruction 5000.2, in which the Department established a preference for the use of evolutionary acquisition strategies relying on a spiral development process, there has been some confusion about what these terms mean and how spiral development impacts various processes such as contracting and requirements generation that interface with an evolutionary acquisition strategy. The purpose of this memorandum is to address those questions.

Evolutionary acquisition and spiral development are methods that will allow us to reduce our cycle time and speed the delivery of advanced capability to our warfighters. These approaches are designed to develop and field demonstrated technologies for both hardware and software in manageable pieces. Evolutionary acquisition and spiral development also allow insertion of new technologies and capabilities over time. Therefore, these approaches provide the best means of getting advanced technologies to the warfighter quickly while providing for follow-on improvements in capability. Evolutionary acquisition and spiral development are similar to pre-planned product improvement but are focused on providing the warfighter with an initial capability which may be less than the full requirement as a trade-off for earlier delivery, agility, affordability, and risk reduction.

Attached is a set of definitions. My points of contact for further information are Skip Hawthorne in the Acquisition Initiatives office, 703-697-6399, skip.hawthorne@osd.mil, or Ramona Lush in the Acquisition Resources and Analysis office, 703-695-5166, ramona.lush@osd.mil.


E.C. Aldridge, Jr.

Attachment
As stated



Editor's Note: This information is in the public domain. To download the attachment to Aldridge's memorandum, go to the Director, Acquisition Initiatives Web site at <http://www.acq.osd.mil/ar/ar.htm#spiral>.



Defense Standardization Program Presents Annual Awards

During a ceremony held today at the Crystal City Hilton Hotel, Arlington, Va., four individuals and three teams received awards from the Defense Standardization Program (DSP) for outstanding contributions to the Department of Defense last fiscal year. Since 1986, DSP has recognized significant achievements in quality, reliability, readiness, cost reduction, and interoperability through standardization.

The DSP mission is to identify, influence, develop, manage, and provide access to standardization processes, products, and services for warfighters and the acquisition and logistics communities. In addition, the program promotes interoperability and assists in reducing total ownership cost and in sustaining readiness.

FOLLOWING ARE THE DEFENSE STANDARDIZATION PROGRAM AWARD RECIPIENTS FOR 2002:

Alan J. Fletcher, Air Force Research Laboratory, Wright-Patterson Air Force Base, Ohio. Fletcher, the grand prize award winner, led a DoD-wide effort to convert from military specifications and qualified products lists to non-government standards for aerospace sealants.

Alan Barone, Defense Logistic Agency (DLA), Defense Supply Center, Columbus (DSCC), Ohio. Barone led the engineering standardization efforts for the high reliability semiconductor program, MIL-PRF-19500.

James A. Crum, DLA, DSCC. Crum completed two key standardization actions as the lead engineer for the electronic relay engineering team.

Michael C. Jones, DLA, DSCC. Jones was the catalyst in bringing a new class of product into the hybrid microcircuit standardization program.

Army Joint Tactical Radio System Program Office, Standardization Software Communications Architecture Team, Arlington, Va. This team is recognized for creating the standardized software communications architecture for use in all future DoD tactical radio designs.

Army AN/PRC-112 Production Support Team, Avionics Directorate, Logistics Readiness Center, Army Communications-Electronics Command, Fort Monmouth, N.J. This team developed the mid-term strategy for upgrading and extending the life of the AN/PRC-112 radio.

Navy Joint Precision Approach and Landing Systems Team, Naval Air Warfare Center, Webster Field Annex, St. Inigoes, Md. This Navy and Air Force team set the architecture for the joint precision approach and landing system, [demonstrating] that global positioning systems technology can solve air traffic control and landing operations problems.

Additional information on the Defense Standardization Program, awardees, and their accomplishments may be obtained by visiting www.dsp.dla.mil.

Editor's Note: This information is in the public domain at <http://www.defenselink.mil/news>.

Risk Data Based on Capability Maturity Models

All DCMA Field Locations Will Have Capability to Provide Free Process Risk Data by Year's End

LT. COL. BOB LANG, USAF

To gauge a contractor's process maturity (on individual programs), the Defense Contract Management Agency has applied the Software Engineering Institute's Capability Maturity Model. While being incrementally deployed, this effort is already paying benefits to program offices, contractors, and the DoD. The goal: continuous process improvement to ensure the warfighter—the end user—receives the highest quality systems.

Wouldn't it make sense to have a way for Government program offices to determine the maturity of a contractor's software development process without incurring the cost and time to conduct a total Software Capability Evaluation? Wouldn't it be efficient to have a way to eliminate redundant reviews of contractor software development processes by different government offices?

Well, there is now a way to obtain this data. Just simply ask. The capability to provide such data is expected to be in place at all Defense Contract Management Agency (DCMA) field locations by the end of this year.

As the on-site government representatives at contractor facilities, DCMA provides assistance to all branches of the military. Its scope of effort is defined within the Federal Acquisition Regulation (FAR). This includes the evaluation and surveillance of contractor management systems such as the processes used in software development. For this, the agency has adopted use of the Software Engineering Institute's (SEI) Software Capability Maturity Model for Software (SW-CMM).

The SW-CMM was the language we needed to speak—and speak fluently—to communicate with the broad range of customers across DoD. It is the language spoken by government program offices when conducting software capability evaluations for source selections or lesser reviews. It is the language selected by the Under Secretary of Defense

for Acquisition, Technology and Logistics (USD-AT&L), in his Oct. 26, 1999, memorandum, "Software Evaluations for ACAT I Programs," to reduce risk on acquisitions. It is the language employed by contractors when conducting a CMM-Based Appraisal for Internal Process Improvement (CBA IPI).

CMM-Based Insight

Our initiative to speak this common language—what we call CMM-based insight—is simple in concept. Taking advantage of DCMA's in-plant presence, we will primarily organize daily observations into findings per the CMM. Observations undergo an internal peer review for conformity to the CMM; then data is freely shared with the applicable contractor and passed to program offices. Findings will be used to concentrate DCMA effort based on risk. Details concerning the process, responsibilities,

FIGURE 1. CMM-Based Insight Goals

- 1.** Provide program and software development process risk information to DCMA and buying Commands
- 2.** Promote supplier process improvements based on trend analysis of CMM-based observations
- 3.** Consistently maintain data to identify process capability in support of source selection and contract monitoring
- 4.** Promote DCMA internal process improvements

Lang is the Director, Defense Contract Management Agency Software Center, Boston, Mass. He has 20 years of active duty service in the U.S. Air Force in various acquisition specialties. His previous assignment was program manager for the Iceland Air Defense System. Lang holds a Bachelor's Degree in Engineering Technology from Norwich University, a Master's Degree in Engineering Management from Western New England College, and is a graduate of the Defense Systems Management College, Advanced Program Management Course (APMC 98-1).

and outcomes are captured in the Method Description Document, available online at <http://home.dcma.mil/onebook/4.0/4.3/inititives.htm>.

The CMM-Based Insight Goals (Figure 1) directly benefit program offices, contractors, and the DoD. Regardless of DCMA location, program offices will have consistent data concerning a contractor's software process maturity for programs within DCMA cognizance. Since data is freely shared with the contractor, concern or disagreement on high-risk areas can be resolved at the working level, or elevated as necessary to the DCMA/Contractor/Program Office Management Council, as described in a March-April 1999 *Program Manager* article by then Air Force Maj. Gen. Timothy Malishenko, "Management Councils Emerge as Valuable Asset in the Program Manager's Tool Kit."

The data can be used in future process reviews to reduce or eliminate redundant areas. The results from this continuous review could also be used as a vehicle to ensure contractors have maintained a process capability level, per DoD Policy published in the USD (AT&L) memorandum previously cited; or in support of independent expert program reviews of software intensive systems, as covered in a USD(AT&L) memorandum, Dec. 21, 2000, "Independent Expert Program Reviews of Software Intensive System Acquisition."

Evaluation Relationships

CMM-based insight is not a software capability evaluation or a CBA IPI (Figure 2). While data could be used to substantiate another evaluation, DCMA will never rate a particular company through CMM-based insight. The initiative is focused on identifying areas of concern on individual programs (i.e., higher-risk process areas) and allocating the appropriate level of resources commensurate with that risk.

Incremental Phases

As previously discussed, the initiative is simple in concept. But like the process of teaching an adult to speak (and think) in a new language, making this transi-

REGARDLESS OF DCMA LOCATION, PROGRAM OFFICES WILL HAVE CONSISTENT DATA CONCERNING A CONTRACTOR'S SOFTWARE PROCESS MATURITY FOR PROGRAMS WITHIN DCMA COGNIZANCE.

tion has involved a culture change in DCMA software surveillance activities. As such, incremental phases (Figure 3) were designed to assist the transition.

Phase I validated the approach at the home locations of our Agency Software Engineering Institute (SEI) affiliates. Phase II verified that approach for suitability and effectiveness in a typical field environment. Phase III will verify the capture and transmission of data before the initiative is implemented agency-wide.

Data Organization Challenges

The primary purpose of Phase II was to verify the approach. Due to the sheer number of inputs—necessary for the correlation of observations to the applicable key practices, internal peer reviews, identification, and subsequent action on high-risk areas—the need for an adequate support tool was recognized early. (This situation will be resolved in Phase III when data collection is incorporated into the common tool supporting the entire DCMA Risk Assessment Management Program.) Despite this burdensome data collection, 45 percent of our field locations agreed to be pilot locations and voluntarily converted their operations. Why? Because of the benefits realized. These benefits are perhaps best illustrated with actual examples.

EXAMPLE 1—IMPROVEMENT NOT RATING

A program office concerned with a history of poor software quality wanted the contractor to operate at CMM Level 3. The company's upper management believed the company was well within these parameters and retained an outside consultant to verify this position. Initial results indicated the contractor was operating at CMM Level 3. The DCMA field office disagreed, however, based upon observations and findings per the CMM.

Working with the program office, the findings were questioned and the issue elevated to upper management. The pro-

FIGURE 2. Comparison of Evaluations

	SOFTWARE CAPABILITY EVALUATION	CMM-BASED APPRAISAL FOR INTERNAL PROCESS IMPROVEMENT	DCMA CMM-BASED INSIGHT
Basis of Evaluation	Software CMM	Software CMM	Software CMM
Company Rating Provided	No	Yes	No
Frequency	One time	One Time	Continuous
Data Refreshed	No	No	Yes (18 Month Max)
Conducting Organization	Typically Government (including DCMA)	Contractor	Government
Basis of review	Sponsor selected, usually within a particular domain	Representative programs across a business base	All programs within DCMA cognizance

gram office held that if the review revealed a significantly different result than that observed in day-to-day operations, the government would sponsor an independent software capability evaluation. If the government evaluation revealed the contractor was more interested in paper ratings than software quality improvement, the government would consider developing a second source for the procurement.

What was the end result? The final evaluation revealed operations at CMM Level 1. The contractor was well on the way to Level 2 but far from the desired Level 3 target profile. Was this a typical contractor/government confrontation? Quite the opposite—it fostered a spirit of process improvement. For the first time, there was an accurate and understood baseline. The contractor developed a road map for process maturity, and during the course of two years achieved the desired Level 3 profile. DCMA, the government on-site representative, participated in the mini reviews and was a team member on the final contractor-conducted CBA IPI.

EXAMPLE 2—RISK-BASED OPERATIONS

One would assume that organizations with higher maturity operations will have a greater probability of producing a higher quality product. Some early work in this area was conducted under the auspices of the Air Force Institute of Technology (Re: *Crosstalk, The Journal of Defense Software Engineering*, September 1995 edition). If such a correlation is accepted, it would seem reasonable to assume that there is less government surveillance of higher maturity operations than operations with lower maturity. In the absence of data, however, people often focus on those areas where they are comfortable. Consequently, a low-risk area might get as much attention as a high-risk area.

This is not so with the CMM-based insight methodology because it is based on data and focuses expended effort in proportion to risk. This is the case at one of our pilot locations where the contractor has achieved CMM Level 5. The

CMM-based insight data will be used to ensure DCMA effort and resources are allocated to the areas of highest risk.

EXAMPLE 3—THE REST OF THE STORY

Is a CMM rating truly representative of all programs at a given facility? As the name states, the model measures a capability. It would seem logical to assume that if a capability has been demonstrated on one program, that it has been applied to all. With mandated levels, though, other pressures come into play.

At one pilot location the contractor had conducted a CBA IPI that resulted in a finding of CMM Level 3. The contractor had selected programs across the business base and then hung a banner over the building entrance saying “CMM Level 3 Certified.” So what was wrong with that?

First, the term Level 3 Certified is confusing and misleading. Certified by whom? Secondly, the review did not include the largest program—one that had been experiencing problems at the international level. While the CBA IPI shows a company’s capability to operate at a given level, it is not necessarily

true for all programs. It should be, and seems to be in most cases, especially when the focus is on process improvement. However, in this particular case it was not.

With the DCMA data, the banner was removed and the applicable program office understood that operations on their program were not at CMM Level 3 and why.

EXAMPLE 4—ELIMINATE/REDUCE DUPLICATIVE REVIEWS

Concerned about software quality, a joint program office planned a review of the contractor’s software development processes. The DCMA pilot location, a front-runner for this initiative, already had the data in the common language of the CMM. It clearly identified strengths and weaknesses. The review was cancelled, with the DCMA data used in follow-on actions with the contractor.

This is only one example, but the dollar savings across the Department quickly add up. According to an article published in the January-February 1998 issue of *Acquisition Reform Today*, “SCE Reuse: Ending Redundant Reviews,” the

FIGURE 3. CMM-Based Insight Implementation

START	PHASE	TASK	PRODUCT	WHO	NEW SITES	TOTAL SITES
Oct 99	I	-Develop & Validate Approach	-Method Description Document (MDD) -Training Material	DCMA SEI Affiliates	4	4
Jun 00	II	-Verify Procedures -Validate Data Collection -Learn & employ methodology	-Updated MDD -Finalized Data Requirements	Volunteer Field Locations	5	9
May 01	IIB	-Refine approach -Learn & employ methodology	-Procedure Update (as required) -Trained personnel	Volunteer Field Locations	10	19
Aug 01	IIC	-Refine approach -Learn & employ methodology	-Procedure Update (as required) -Trained personnel	Volunteer Field Locations	5-10	24-29
TBD (Est. Winter 01/02)	III	Verify Data Integration into DCMA Risk Assessment Management Program	Data collection tool supporting CMM-based operations	All Pilot Sites	0	24-29
TBD (Est. Spring 02)	IV	Agency-Wide Deployment	Process Data in terms of SW-CMM	All DCMA locations	13-18	42

cost to conduct a software capability evaluation has been estimated at \$50,000 for both the government and contractor.

Experience and Training

The Software Engineering Institute's 1994 publication, *The Capability Maturity Model: Guidelines for Improving the Software Process*, defines a complete process as having 1) procedures and methods for defining the relationship of tasks, 2) tools and equipment, and 3) people with skills, training, and motivation. The first two elements have already been addressed. Concerning people, the agency has over 400 personnel supporting software quality assurance. To assure this workforce is properly prepared to deliver consistently first-rate assessments, we have instituted a multi-phase development program.

BASIC TRAINING

The agency's formal training is called the DCMA Software Professional Development Program. Individuals proceed through two training levels. Level 1 requires completing 72 hours of computer-based training, 40 hours of classroom instruction, and a formal mentoring program focused on practical application of course material. Level 2 requires an additional 97 hours of computer-based training, 120 hours of classroom instruction, and further mentoring.

The SEI's CMM is integrated into the computer-based training, classroom instruction, and mentoring. Currently, 70 percent of agency software personnel have obtained Level 2 status. To maintain this level, individuals must complete a minimum of 12 hours of software-related training each year.

APPLICATION TRAINING

As each field location begins operations under the CMM-based insight initiative, all personnel undergo an additional 20 hours of specific application training conducted on site by the DCMA Software Center. Applicable contractors and government program offices have been welcomed into this training. It focuses specifically on implementing initiatives and daily operations.

WHILE FULL AGENCY
IMPLEMENTATION
WILL NOT OCCUR UNTIL
SEPTEMBER 2002, THE
APPROACH [CMM-BASED
INSIGHT] HAS BEEN
DEVELOPED WITH SEI
AFFILIATES AND IS BEING
USED BY A MAJORITY OF
DCMA FIELD LOCATIONS.

ON-CALL ASSISTANCE

DCMA personnel have direct access to the six-person DCMA Software Center. In addition, one eighth of the total field workforce has completed the SEI's Software Capability Evaluation training. Additional assistance is available to any of our evaluators from highly qualified

agency personnel who are SEI-certified lead assessors.

IMPLEMENTATION MEASUREMENT

Training provides a foundation for conducting business per the CMM, but it does not directly correlate to experience, which can only come with time. Progress in implementing the initiative has been promising. For instance, more and more companies, when conducting CBA IPIs, have requested our personnel as team members.

However, to gauge implementation progress for this initiative across the entire agency and to make necessary adjustments, the agency is developing a top-level metric based upon percentage of activities (observations) made on high- and moderate-risk processes vs. total number of activities (observations) performed. Progress will be reviewed by the agency director, his or her senior leadership team, and DCMA field commanders.

CMM-Based Insight and CMMI

The baseline for our efforts is the SW-CMM. We fully expect, and are making preparations, to switch over to the Capability Maturity Model Integrated (CMMI) at a later date. The agency is part of the SEI-led CMMI Steering Group responsible for developing the

FIGURE 4. DCMA Pilot Locations

Phase I (Beginning Oct 99)

- Boston (Nashua)
- Delaware Valley (PA)
- Denver
- Syracuse

Phase II (Added Jun 00)

- Boeing (Philadelphia)
- Lockheed Martin Oswego (NY)
- Lockheed Martin Sunnyvale (CA)
- St Petersburg
- Sikorsky

Phase II B (May 01)

- Birmingham (Huntsville)
- Bell Helicopter Textron
- Northrup Grumman, Bethpage
- Northrup Grumman, Melbourne
- San Antonio (NASA, Houston)
- Hartford
- Baltimore (Manassas)
- Boeing St Louis
- Orlando (Harris, Melbourne)
- Springfield (NJ)

Phase II C (Summer 01)

Up to 10 Volunteer locations

SW-CMM/CMMI turnover within the DoD.

For CMM-based insight, the transition should incur little breakage moving to the integrated model. The biggest challenge in using either model is the discipline and knowledge of application—both of which we are gaining with our current effort and are fully transferable. Field sites that came aboard in each phase are shown in Figure 4.

DCMA Credibility

Air Force Lt. Col. Joe Jarzombek, in his August 1999 *CrossTalk* article, “Integrating Acquisition with Software and Systems Engineering,” raised the point: “A Level 3 development effort, coupled with a Level 1 acquiring effort, often equates to a Level 1 delivery capability; yet the Level 3 developer is often blamed, and the Software (SW) CMM is cited as inadequate.” I saw this firsthand as a junior officer—with disastrous results. So how does DCMA measure up?

To answer that question, we took the sister capability maturity model—the Software Acquisition CMM—and tailored it for DCMA use. We pilot tested and made adjustments as applicable. We then went agency-wide, conducting reviews from November 1999 until April 2000. Eight equally qualified teams were used to maintain consistency. What were the results?

A few organizations were operating at the defined level, but predominately the

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PERCENTAGE OF ACTIVITIES
(OBSERVATIONS) MADE ON
HIGH- AND MODERATE-RISK
PROCESSES VS. TOTAL
NUMBER OF ACTIVITIES
(OBSERVATIONS)
PERFORMED.

field offices within the agency operate at the performed level (Level 1). More importantly, we established a solid baseline, and each location has a detailed road map for improvement per the model structure.

Field locations have been working improvements, and the first round of follow-on appraisals is planned in the Spring of 2002. The original evaluation team members constitute the personnel pool to support independent evaluation of improvements, similar to the industry approach with a CBA IPI.

A Standard Methodology

DCMA was always required and continues to conduct evaluations of contractors' software development processes per the FAR. The agency is now deploying a standard methodology via continuous process evaluations that is organized in the CMM—the common DoD language—and is based on the day-to-day observations of the in-plant DCMA personnel. Findings are peer reviewed, and all data is freely shared with the applicable contractor and is available to government program offices.

While full agency implementation will not occur until September 2002, the approach has been developed with SEI affiliates and is being used by a majority of DCMA field locations. Program offices, the contractors, and the DoD are already realizing benefits.

So, how much does the agency believe in using this approach to gauge contractor operations? Enough so that we are *walking the walk and measuring our operations to the same framework*.

Editor's Note: The author welcomes questions or comments on this article. Contact him at rlang@dcmdc.dcmil.

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Green Light Ahead for Missile Defense Program

LINDA D. KOZARYN

WASHINGTON, March 22, 2002—The U.S. Missile Defense Agency and Anti-Ballistic Missile Treaty constraints part company June 14, freeing the agency to do what President Bush decides about deployment, a senior defense official said here today.

Bush announced in mid-December that the United States was withdrawing from the 1972 ABM Treaty with Russia. He said the treaty hindered America's ability to develop ways to defend against terrorist or rogue-state missile attacks.

Pete Aldridge, Under Secretary of Defense for Acquisition, Technology and Logistics, said DoD had prepared a test program that included using a series of silos in Alaska. He told reporters at a Pentagon roundtable the silos could "be used as an emergency missile defense capability" once ABM restrictions are off. However, he stressed, no deployment decisions have been made.

In January, Defense Secretary Donald H. Rumsfeld approved an organizational change for missile defense that is now being implemented. "We're streamlining the process to give Gen. Kadish an ability to make very tough decisions in what we call 'a system of systems' approach to missile defense," Aldridge said.

Air Force Lt. Gen. Ronald T. Kadish is the Director of the Missile Defense Agency, formerly the Ballistic Missile Defense Organization.

The agency is chartered by the President and mandated by Congress to acquire highly effective ballistic missile defense systems for forward-deployed and expeditionary elements of the U.S. Armed Forces. The agency was also tasked to develop and, if directed, to acquire

systems for ballistic missile defense of the United States.

Rather than have the Missile Defense Agency go through the comprehensive review process currently required in the defense acquisition process, Aldridge said, officials are combining the various missile defense weapon systems. These include various intercept stages—boost phase, mid-course and terminal; various ranges of rockets—short-, medium- and long-range; and ground-, sea- and space-based technologies.

All those are weapon systems in their own right, Aldridge said. "What we've done is... [combine] all those into essentially 'a system of systems.' This gives Kadish more authority and will speed up the overall acquisition process." The Missile Defense Support Group, formed to provide oversight of the agency, Aldridge noted, will review the general's decisions.

The group includes 13 persons representing the Office of the Secretary of Defense, the Joint Staff and the Military Departments. They are supported by 26 analysts who will handle day-to-day details. The support group will be given access to all the data on missile defense and will have the ability to do independent analyses.

"They report to me," Aldridge said, "and they provide advice to the Director of the Missile Defense Agency and to the Senior Executive Council." Deputy Defense Secretary Paul Wolfowitz chairs the council, which serves as the Missile Defense Agency's board of directors, he added, and will make major decisions regarding deployment.

Editor's Note: This information is in the public domain at <http://www.defenselink.mil/news>.

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THE FALCON AND THE MIRAGE: MANAGING FOR COMBAT EFFECTIVENESS

Author: B.A. "Tony" Kausal
Publisher: DAU Press (November 2001)

Great differences exist between France and the United States in the ways each nation acquires new weapon systems. Some differences are cultural; others are a difference in organizational or management style. Much can be learned from recognizing those differences and gauging the results they have on meeting milestones and producing successful programs.

This guidebook examines the French Ministère de la Défense and the Délégation Générale pour l'Armement (DGA) and compares and contrasts each agency to the U.S. acquisition structure, and the ways each interacts with Defense industry. The author examines the System Program Offices of each country, and gives his insights based on years of experience with the U.S. Air Force and his recent assignment as part of a professional exchange between the Defense Acquisition University (where he was the Air Force Chair in the DAU Executive Institute), and the Centre des Hautes Études de l'Armement (CHEAR) in France.

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Author: Robert F. Delaney
Publisher: DAU Press (January 2002)

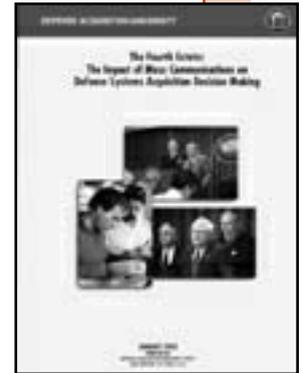
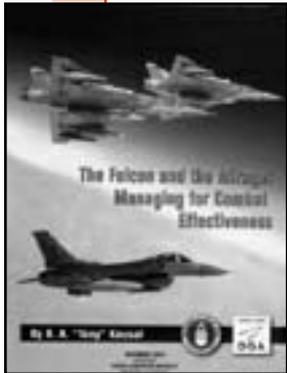
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Those eligible to attend are Ministries, Departments of Defense, and supporting Defense Industries from the four IDEA nations who are actively engaged in international defense acquisition programs.

This year's seminar will be held July 8-12, 2002, in Paris, France. The last day of the seminar, July 12, will be dedicated to the educational aspects of international acquisition.

The IAPS-A is by invitation only. Those desiring an invitation who have not attended past international seminars should submit a letter of request, on government or business letterhead, to DSMC by fax (703-805-3175).

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Critical Success Factor (CSF) Analysis for DoD Risk Management

CSF—More Than Making a List

DR. JAMES "JIM" DOBBINS

In the September-October 2001 issue of *Program Manager*, I provided a short description of the Critical Success Factor process model. On p. 49 of that article, I reference a statement from Navy Rear Adm. John A. Gauss, San Diego Space and Naval Warfare Systems Command Program Executive Officer (PEO). Speaking on the applicability of the CSF analysis, Gauss said, in part:

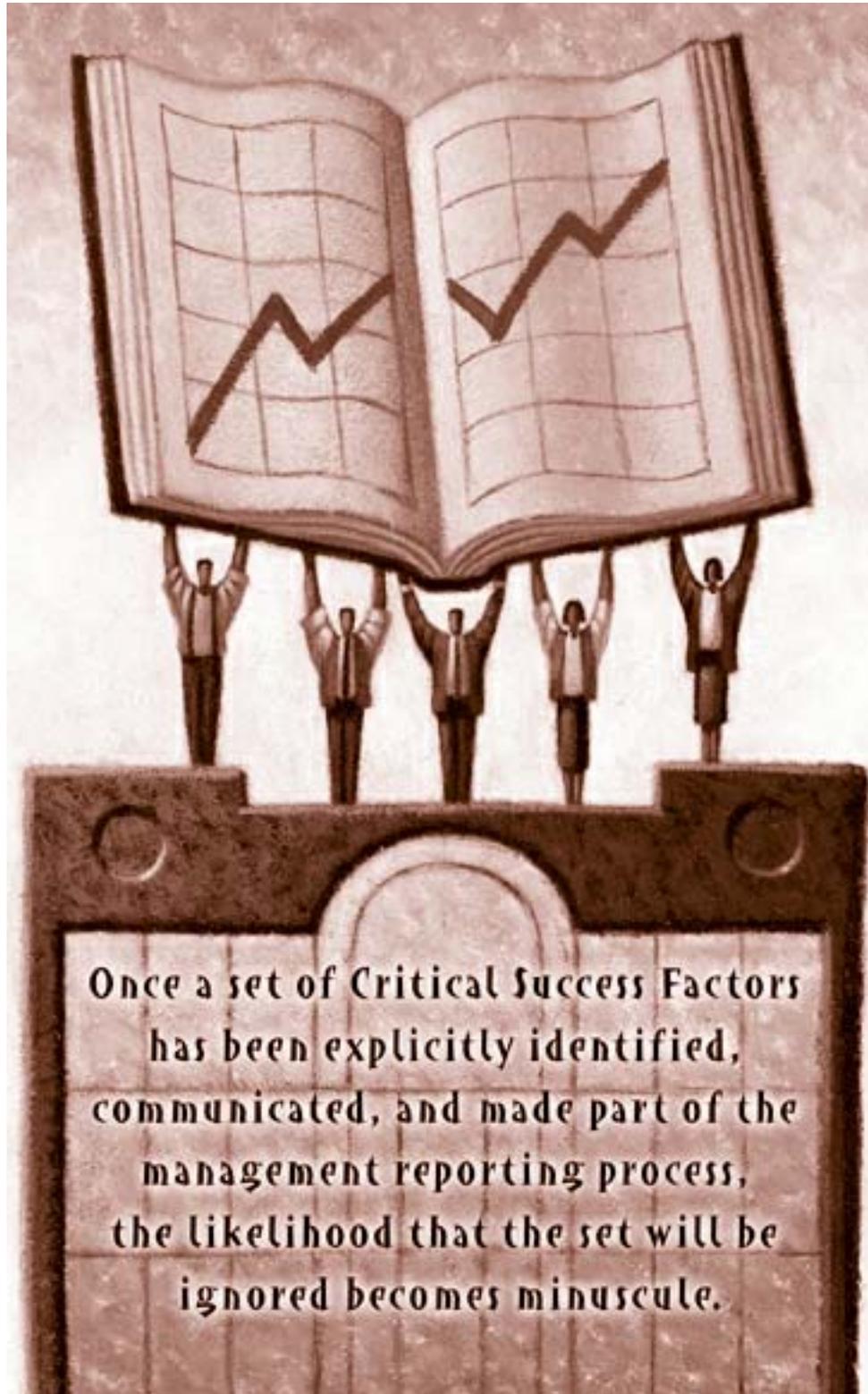
"...it [CSF analysis] is one of the first and most important steps to take in order to build a successful risk management program."

In this article, I will address this one aspect of CSF analysis—its use in risk management.

Every Risk is a Future Event

We are all familiar with typical risk management processes. The fundamental notion is that we identify risks, we assess their probability of occurrence, and we assess the consequence of occurrence. Then we put a risk management plan in place that is designed to eliminate, or alleviate the impact of, the serious risk events. Every risk is necessarily a future event, and only when the risk event actually happens is the risk transformed into a problem. The better we are at identifying risks and understanding the underlying basis of our risks, the better we can manage the risks. Our objective is to eliminate as many as possible of the serious risks.

Dobbins is Director, Research and Performance Support, Curricula Development and Support Center, Defense Acquisition University, Fort Belvoir, Va.



One of the struggles we always have in risk management is assessment of the probability of a risk event. Almost always, some level of guesswork is involved, and that implies we have a certain level of confidence in our assessment of probability. The better we become at eliminating the guess factor, the more confidence we can have in our assessment, and the more confidence we can have in the correctness of the investments we make in terms of labor and technology in executing our risk management plans.

Given this, we will now look at how we can apply CSF analysis to the risk management process.

Foundation for CSF Analysis

As a starting point, let us recap the definition of a Critical Success Factor, for in the definition we can see almost intuitively how CSF analysis relates directly to risk management. In his March-April 1979 seed paper, published in *Harvard Business Review*, in which he introduced Critical Success Factor theory, John Rockart defined Critical Success Factors as:

A) "The limited number of areas in which results, if they are satisfactory, will ensure successful competitive performance for the organization. They are the few key areas where things must go right for the business to flourish. If results in these areas are not adequate, the organization's efforts for the period will be less than desired."

B) "Areas of activity that should receive constant and careful attention from management."

Unless the CSF are stated in the form of an activity, applying the CSF to a given program presents many problems. Critical Success Factors are *activities*, not goals. They are therefore activities, *all* of which are critical to overall success. They are the things to which the program manager must give personal attention. Failure to accomplish the CSF successfully will be a major deterrent to overall program success. Activities can be tracked and measured. By doing so, we

can determine if the CSF are being accomplished successfully.

A fundamental premise of CSF theory is that if an activity is identified as critical to program success—and the program manager's time is focused on this activity, and program resources are expended to execute, evaluate, and measure this activity—the program is at reduced risk. Conversely, if an activity being given significant attention by a program manager is in fact not critical to program success—and precious program manager activity and attention is thereby being drawn away from items that actually are critical to success, and therefore do require program manager attention—the program is at increased risk.

Critical in CSF analysis is understanding the constraints upon which each CSF depends, for it is from understanding the constraints that both the CSF and the measures for each CSF are derived. It is also in understanding the constraints that much of the guesswork in risk assessment is alleviated. Additionally, changes in the constraints signal a manager when changes to the set of CSF are occurring. By applying the CSF analysis process, the manager learns how to think in terms of CSF; and once the process is learned it can be repeatedly applied to the current program when necessary, or can be applied for any subsequent assignment the manager undertakes.

The acquisition management strategy, which is inherently a risk management process, must be focused on the correct issues or the system will have a high probability of failure to achieve the program goals for cost, schedule, and performance. All three of these target goals, which are present for every program, are goals which are achieved, or not, depending on the success of the program manager in properly addressing the program risks.

The majority of the prior research done on CSF focused exclusively on CSF identification and did not investigate the three interrelated areas:

- CSF Identification
- Underlying Constraint Analysis
- Measure Identification.

Nor did any of the prior research attempt to apply CSF analysis to risk management. Acquisition risk management application of CSF analysis is essential for both individual programs and for systems of systems. It is also becoming increasingly important for acquisition management as we move to capability-based acquisition.

As programs advance toward completion, and given that each program has several intermediate milestones, CSF related to a given milestone can be determined. Each manager will be at a particular milestone point on his or her program, and the CSF identified may be milestone-dependent.

Successful managers do indeed identify CSF informally, as Gauss indicated. However, it is advantageous to have a *formal* process for doing so; likewise, it would be advantageous to DoD if each program manager understood and applied the process, as suggested by Air Force Lt. Gen. Robert Raggio. Without a clear set of CSF for the full program life cycle, including availability of a routine process for CSF re-examination, the program manager will continually face the risk of unknown factors with regard to program success, or may spend a considerable amount of his or her valuable time managing issues and evaluating data other than those critical to program success. This, in and of itself, is an additional risk to program success.

Explicit or Intuitive

Just as is sometimes done by their civilian counterparts, many of the more skillful program managers intuitively determine CSF to manage programs rather than rely on standard information from their own Management Information System (MIS). However, where the CSF are not explicitly identified and recorded, they do not become a part of the program history and are not explicit elements of the management reporting process. Furthermore, the underlying constraints for the CSF do not command

attention, and the CSF are seldom measured. A successor program manager, given his or her own skill level and background, may be more or less capable of intuitively identifying CSF or may focus on a different set of intuitively perceived CSF, if indeed any at all.

The result is that a given acquisition program may encounter wide swings in managerial focus and direction due to the particular skills and backgrounds of the different program managers who will attempt to guide the program to completion, each of them attempting to integrate and manage complex information related to several different functional disciplines. In the program management office, a different person may be responsible for each of these different disciplines.

In the absence of an active and continuous process of identification of the program CSF, this is all done without any documented continuity of those activities critical to program success, none of which have become part of the program history. However, through application of the CSF Process Model, once the CSF are explicitly identified and available to successor program managers, with the underlying constraints clearly and explicitly stated, the information gathered significantly supports program management stability and alleviates many of the adverse effects of program manager discontinuity. Once a set of CSF has been explicitly identified, communicated, and made part of the management reporting process, the likelihood that the set will be ignored becomes minuscule.

Therefore, establishing clear CSF to support the acquisition management of large defense programs would be a significant element of risk management and of eventual program success. This requires an iterative process for CSF identification and validation, analysis of the constraints underlying each CSF, and a determination of the measures needed for each identified CSF

It is in the iterative analysis of the constraints behind each CSF that the likelihood of change in the CSF, or the need for new CSF, will be recognized.

Managerial Core Competencies

In a study on CSF in management environments done by Les Pickett and published in the Spring 1998 issue of *Public Personnel Management*, he addressed the need to focus on development of managerial core competencies. This study identified as two of the CSF for major organizations the importance of senior management responsibility: 1) to identify the enterprise core competencies, and 2) to ensure that managers and others in the workforce have competencies that are adequate and appropriate.

In this age of downsizing and rightsizing, it is interesting to note that in this major survey of global organizations, the author concluded that "Competent people are the key to future success and offer organizations their only sustainable competitive advantage." Among other Critical Success Factors identified in this report was the ability to create, apply, and extend knowledge in the workplace, which clearly fits into the DAU corporate university model.

This study also found that although learning as a business strategy is of major importance, the performance measures of many organizations today do not place value on knowledge as an asset. The report concludes that people must

be regarded and managed as an asset, not as an expendable resource.

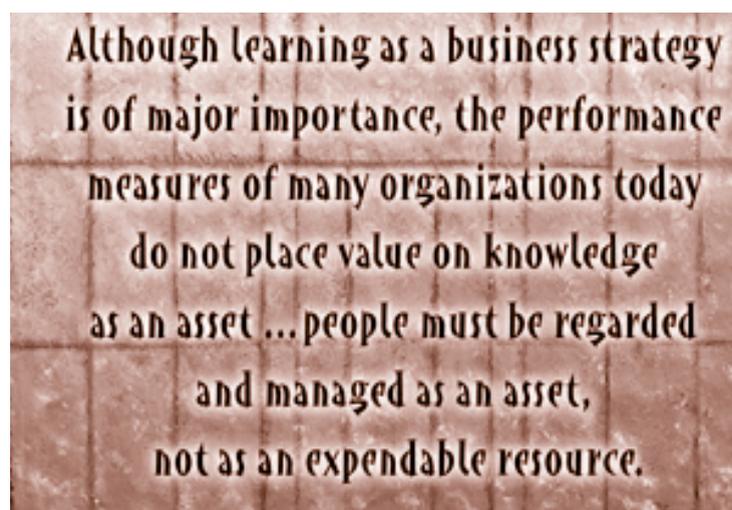
Another and similar report titled "Which Way to Competitive Advantage," was published in the January 1998 issue of *Strategic Management*. This article also focused attention on core competencies. It is an interesting inquiry into the current trends in strategic management and concludes that it is not *position in relation to competitors* that is key to success, but rather *where* the principal CSF are exploiting the resources, capabilities, and core competencies of the firm. The choice of strategy should be most influenced by how the organization can best exploit its core competencies relative to opportunities in the external environment, and not be dictated by the constraints of the environment. Program management certainly fits this picture.

Process Focus

The focus on process is important because in the program management environment today, so much is in constant flux, caused by rapid changes and advances in technology, changing technical or financial program requirements, corporate mergers, internationalization of many programs, use of Integrated Product Teams (IPT), moving to capabilities-based acquisition, and a focus on systems of systems. *Process* allows us to respond to a rapidly changing environment. *Tools* are generally not so flexible.

By using the CSF Process Model to identify contextually relevant CSF and their underlying constraints, together with

their corresponding data requirements, significant organizational implications become evident. Identification and documentation of the CSF at the top level of management will lead to the identification and documentation of CSF at the next lower level of management, with each set of CSF retaining its own corresponding data element identifications. More importantly, the



Although learning as a business strategy is of major importance, the performance measures of many organizations today do not place value on knowledge as an asset ... people must be regarded and managed as an asset, not as an expendable resource.

identification of the CSF for the lower level managers, done in light of the CSF identified for the top level of management, results in a set of hierarchically consistent CSF covering multiple vertical levels of management, and can provide horizontal integration for systems of systems.

Each level of management will understand what the information needs are of the next higher level of management, and therefore what their own success criteria must be for overall organization success. Each level of management collectively will be able to provide the information and data necessary for management of the CSF at the next higher level, as well as assure that each has his or her own data necessary for management of each individual organization's CSF.

Application to Risk Management

A set of CSF is by nature very specific to a given manager, and must reflect that particular manager's needs at any given time. This leads to the conclusion that managers need a generalized process that can be used by any manager at any time to identify and evaluate the CSF pertinent to his or her job. Since the process is general, unlike the CSF which are highly specific, managers can apply the process, once learned, to any management environment in which they find themselves. It becomes a permanent part of their management thought process.

Thus, the successful identification and use of CSF at any point in the project life becomes primarily an issue of properly applying a general process, and recognizing the possibility of CSF changing over time. That CSF can change over time is not intuitively obvious. One naturally expects that CSF initially identified for a given program, with its given goals and purpose, will be relatively stable. In some programs this is true. While this possibility exists, conditions to which the program must respond frequently change, thereby causing a change to the program Critical Success Factors. These conditions can be technical-, financial-, or personnel-related.

In determining CSF, program managers are interviewed and asked to respond to a set of questions in the following 10 key categories defined as the basis for the model:

- Global or Industry Related
- External Influences
- Internal Influences
- Current and Future
- Temporal and Enduring
- Risk Abatement
- Performance
- Special Monitoring
- Quality
- Modification Management.

The interviewer uses a questionnaire-guided process to show that through CSF analysis, the manager is able to: 1) determine his or her contextually specific CSF, 2) identify the constraints underlying each identified CSF, and 3) determine the measures applicable to each identified CSF. Through application of the guided interview process, the constraints surface as managers discuss the issues of importance relative to each of the 10 criteria categories of the model.

The process is initiated by first identifying all elements of importance related to each of the 10 key criteria categories. These statements are then grouped by topic, regardless of the 10 categories in which they appeared. A CSF is then identified for each topic group, and these important items related to each topic are the underlying constraints for the CSF for that topic.

The CSF for each separate topic group are always stated as an activity. The candidate measures for the CSF are then derived from these same constraints. This enables managers to grasp the concept of connecting the underlying constraints to each CSF, and linking the measures for the CSF to these same underlying constraints. The underlying constraints involve little guesswork and can be cross-verified by others.

Because of the guidance provided through these areas of inquiry, a manager does not simply list the activities he or she believes are critical. This pre-

vents the manager from reacting to the most pressing current problem or the most recent crisis. The CSF are not explicitly stated by the manager. Rather, they are derived from the information provided by the manager as each of the 10 key areas are considered.

Therefore, the process itself works to prevent the use of identification of CSF as a form of crisis management, and leads the manager to view the program from a variety of perspectives, which are both tactical and strategic, and which focus on specific issues such as external support, performance, and quality. Therefore, the process itself, while giving the manager the freedom necessary to identify all issues critical to program success, also leads the manager to consider the program from several perspectives and provide a balanced view of the activities required for eventual success in reaching the goals of the program.

After the initial CSF identification process is completed, the complete set of constraints for all the CSF is examined for collective consistency. If a critical activity (constraint) required for CSF No. 1 is in conflict with a constraint forming part of the basis for CSF No. 2, then it may not be possible to do both CSF; and the manager must again examine the activities he or she has deemed critical to determine the root cause factors needed to resolve this conflict.

Two activities, both supporting CSF, cannot remain in conflict if the program is expected to be successful. If the underlying constraints supporting different CSF are in conflict, the CSF are necessarily in conflict. This conflict analysis is an important phase of the CSF Process Model and is used to determine the criticality and validity of the CSF. If the conflict cannot be resolved, this is an indicator the program success is at risk or the program goals need examination.

By determining and recording all three types of information—CSF identification, constraints, and measures—and

by making this part of the program of-fice documentation, the managers will be able to incorporate the information needed to support the CSF into their executive Knowledge Management system, and use the information to determine when a change to a given CSF is occurring.

The key to understanding the need for the change is recognizing when documented constraints underlying a given CSF are no longer valid. The new or changed CSF, and its related constraint information, can then be used as the foundation for revising the Knowledge Management information, the strategic plan, and possibly the organizational structure, in any way necessary for the manager to have the best possible information and implementation strategy for managing the program and accomplishing the CSF.

Once managers have gone through this process with the interviewer, they should understand the process well enough to perform the CSF analysis on their own without any outside assistance. Since this is a process and not a list, the manager can apply the process again at a later time to the same program, or can apply the same process to another program to which he or she is assigned.

When the resultant information is used in the actual management setting, and since the linking information between the CSF and the CSF measures is the set of constraint data, the stability of the constraint data will serve as the key to understanding if and when a given CSF should be re-evaluated. When it is said that a CSF may be changing, the possibility is that it may change slightly or that it may go away altogether. The degree of change is determined by the extent and effect of the changes occurring in the underlying constraint information. When a CSF changes, an extended analysis should

also be done of the changes in all of the constraint information to determine if new CSF are surfacing.

Quantitative Analysis

One desire of many managers is to have some kind of quantitative analysis. The CSF Process Model provides that as a part of the overall analysis. When the report is complete, the same information gathered in the interview and used to derive the CSF and the measures is used as input information for a spreadsheet quantitative risk analysis. Questions asked during the interview, or data derived from the interview, are used to answer 20 questions for this quantitative analysis. Typical questions, among others, follow:

- Whether the program goals have been explicitly stated
- Whether a critical path analysis has been done.
- Whether the CSF are consistent with each other.
- Whether there is at least one CSF for each life cycle phase.
- Whether constraints are clearly identified for each CSF.
- Whether measures have been identified.
- Whether the data needed for measurement of the CSF are available.

Each question has a weighting factor. A numerical score is derived for each CSF, and the final score for each CSF is then evaluated as LOW, MEDIUM, or HIGH risk, with respect to the risk of being

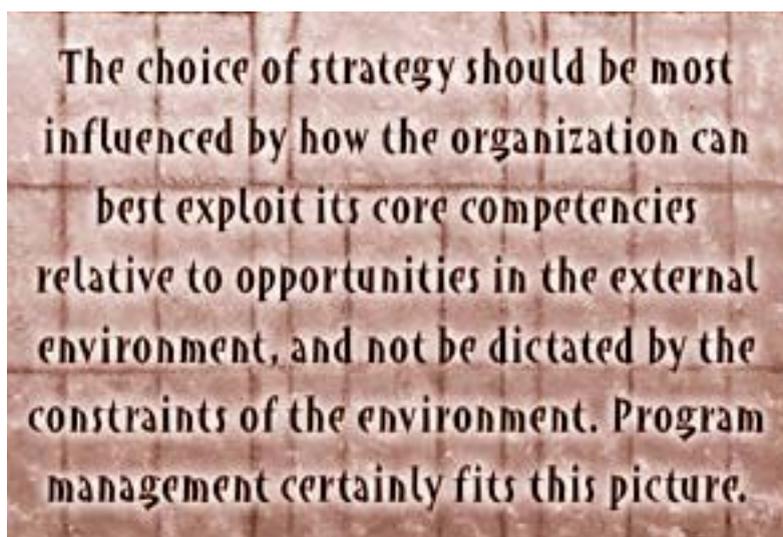
able to successfully accomplish that CSF. The LOW, MEDIUM, or HIGH rating is assessed based on a range within which the numerical score falls. By having the numerical score as well as the LOW, MEDIUM, or HIGH rating, the manager can see how close or how far each score is to the next higher rating. Then an overall program numerical score is derived, and an overall program LOW, MEDIUM, or HIGH rating is assessed.

A significant advantage of this spreadsheet-based analysis is that each individual CSF is evaluated. Therefore, if a given CSF has a score less than desired, the manager knows where to concentrate his or her attention to achieve success. From the spreadsheet information, the manager understands specifically why the score is less than desired, and therefore what must be done to correct this situation.

Walking a Tightrope

We can make several observations after having analyzed the application of the CSF Process Model to several programs. The first observation has to do with scope and complexity. Some programs dealt with a level of complexity that could almost be considered routine. Others dealt with issues that are very significant but which are limited in their breadth. Alternatively, the issues with which other cases had to deal are extremely diverse. The application of state-of-the-art technology, personnel issues, political issues, contracting issues, and budgetary issues were all converging on these managers. The program budgets are very large, the issues are complex, and yet the same CSF Process Model was employed, in the same way, by all of these managers. The stability of the process transcended all of the scope and diversity issues found on all of the programs investigated to date.

If we examine an industrial environment and



consider the types of issues that must be dealt with, and the levels of responsibilities, there seems to be very little essential difference between the issues the managers must respond to in private industry and those dealt with by the managers for whom the CSF Process Model has been used. All of these managers deal with contracting issues, suppliers, procurement, technology application or technology development, or both; and they all deal with budgetary and personnel issues.

Whether a manager is a Chief Executive Officer (CEO), a Chief Technology Officer (CTO), or Chief Financial Officer (CFO); whether he or she is a DoD Program Manager, a PEO, a dean of a university, or a bishop managing a large diocese—all of them will be dealing with issues that can be evaluated using the CSF Process Model.

As long as the managers are intelligent and competent, there is every reason to expect that application of the CSF Process Model will produce results for any manager or group of managers that would be as successful as those produced by the managers interviewed so far. The specific objective of the project being managed, or the organizational environment within which the manager functions, may be different from the situations of the managers interviewed thus far; but those are contextual issues and, as the research done to date shows, contextual issues do not interfere with the effectiveness of the application of the CSF Process Model.

In some cases, the detailed identification of the constraints for one or more CSF may not be clear cut and may require significant effort to resolve. In some cases, the issue is identifiable, but the activities required to successfully address the issue are not so obvious. It may be a need to develop a plan to respond to some near-term emergency such as a funding or manpower shortfall. In others, it may be a need to decide how critical technical resources will be allocated over the life of the program. The impact of these decisions may involve millions of dollars.

In these cases, the CSF Process Model may have to be repeated periodically as the information needed to address the issues adequately becomes more definitive. Some of the managers interviewed to date have had these kinds of issues to address—some short-term and some strategic. In industry at large, similar difficulties also arise when trying to decide how to respond to a new competitive threat or how best to restructure a company or division.

In general, issues that require skill in strategic thinking are very troublesome for managers whose strategic thinking ability is limited. It is also not always obvious in advance that skill in strategic thinking is needed, or that the skill is absent, since this skill or lack thereof is often independent of intelligence. Some very bright people simply do not have strategic thinking skills. Sometimes the lack of ability to think strategically begins to surface when probing questions are asked and the response clearly shows a lack of recognition of the strategic aspect of the question.

In such a case, the manager will often revert back to what he or she is comfortable with and address something peripheral to the question raised, but which is more immediate in terms of a response to the question. This places a burden on the interviewer not to do the thinking for the manager, but to perhaps ask some leading questions to see how well the implications of what has been said are understood. In such an instance, the interviewer is walking a tightrope to avoid injecting interviewer bias into the results. The results have to be the manager's, not the interviewer's. It remains to be shown by further research whether this issue of the ability to do strategic thinking may be a limiting factor in determining the lowest level of management to which the CSF Process Model can be effectively applied.

The larger and more complex a program is, the more complex are the integration decisions related to the various critical elements. By effectively applying the CSF Process Model, and iterating on this process at periodic intervals, the pro-

gram manager is able to focus on those activities of critical importance to project success and incorporate the results into the various elements of the strategic management process. This is particularly important as we move toward management of systems of systems and toward capability-based acquisition.

Should every program manager be encouraged to perform a CSF analysis? From the information gathered thus far, the primary candidates are those managers of programs with relatively high technical, business, or organizational complexities, which may jeopardize achievement of program goals and objectives if not managed with considerable care and attention. Many of these programs have a high budget, but that is not an absolute criteria.

Managers whose programs are relatively routine and which can be managed well using typical everyday management techniques, may be successful if they use their normal risk analysis process and then do a CSF analysis only if something unusual or threatening surfaces. Executive managers, such as the PEO, should perhaps prioritize the programs on which a CSF analysis is recommended and assure that the managers for those programs are able to conduct the analysis effectively. In some cases, it would be advantageous for both the government program manager *and* the prime contractor program manager to each complete a CSF analysis.

Should all program managers learn how to perform a CSF analysis? Since conducting an effective CSF analysis requires more than making a list, and primarily requires learning how to think in a different way, education in the CSF analysis process and learning how to think in terms of CSF might be of benefit to all managers. It may broaden their analytical skills and, should the need suddenly arise, it will put them in a position to be able to quickly perform a CSF analysis.

Editor's Note: Dobbins welcomes questions or comments on this article. Contact him at jim.dobbins@dau.mil.

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To obtain a copy of ARQ Guidelines for Authors, visit the DAU Web site (<http://www.dau.mil/pubs/arq/arqart.asp>). To inquire about your manuscript's potential for publication, call the DAU Press at (703) 805-3801 or DSN 655-3801; fax a request to (703) 805-2917, ATTN: DAU

Press (Norene Fagan); or e-mail Norene Fagan at (norene.fagan-blanch@dau.mil).

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New Version of PM CoP Portal Now Online!

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The Assistant Secretary of the Navy for Research, Development, and Acquisition (Acquisition Reform Office), and the Defense Acquisition University (DAU) have updated their recently developed Program Management Community of Practice (PM CoP) Web site. In addition to a new user interface, the site features better support for discussion forums, member information for community collaboration, and new content in the areas of contract management and risk management.

The PM CoP portal and communities are helping the program manager, the program management team, and their industry partners perform their jobs more effectively through knowledge sharing. PMs now have anywhere, anytime (24/7) program management support for job performance through a Web portal. Populated with links to net materials, lessons learned, questions, best practices, yellow pages, and chat capability, the goals of the PM CoP include: knowledge capture and retrieval, collaboration, solution development, new idea generation, and online mentoring of acquisition workforce personnel.

The development and support team consists of executive leaders, an Overarching Integrated Product Team (IPT), and Working IPTs, which include joint leadership and membership. Through the participation of 30+ current and former program managers in February 2001, five key high-priority kick-off areas were identified in supporting a PM community :

- Risk Management
- Contract Management
- Software Acquisition Management
- Systems Engineering
- Earned Value Management

Currently, Risk Management, Contract Management, and Systems Engineering communities are linked to the portal. A previously developed Total Ownership Cost (TOC) community has also been integrated into PM CoP. Links are also provided to information sources on various subjects of interest to the Program Management community, which are candidates for future communities of practice.

How can the PM CoP benefit you and your program? The PM CoP supports program managers from the ranks of the DoD acquisition, technology, and logistics workforce and their executive teams by providing a valuable resource to aid their program management efforts in several areas:

- Solving real-world problems and performing tasks typical of the acquisition workforce.
- Managing requirements.
- Performing political, social, technical, economic, and programmatic activities.
- Achieving organizational goals more efficiently.

Long-Term Plans

The long-term PM CoP vision calls for community support for all key acquisition functional areas. Eventually, the Navy Acquisition Reform Office and DAU anticipate that there may be around 40-50 key functional areas. In the coming year the Navy Acquisition Reform Office, Defense Acquisition University, Office of the Secretary of Defense, and Defense Contract Management Agency will partner to develop an Earned Value Management focus area within the PM CoP.

What are you waiting for? Log in now, learn, and share. Your knowledge contributions are what the community is all about!



JOIN DAUAA!

A T T E N T I O N

Defense Acquisition University Graduates, Faculty, and Staff!

The name of the Defense Systems Management College Alumni Association—DSMCAA—recently changed to recognize DAU-DSMC organizational realignments and provide for a broader-based, more inclusive membership. The new name is the Defense Acquisition University Alumni Association (DAUAA). The DAUAA Web site URL and e-mail address have also changed:

Web Site: <http://www.dauaa.org>
E-mail: dauaa@erols.com

The process to change the Constitution and By-laws will proceed over the next several months.

If you do not yet belong to DAUAA, take advantage now of the great benefits of membership. As a graduate of any DAU-DSMC course, you are eligible to join a select group of acquisition workforce professionals and receive DAUAA benefits. Your benefits as a DAUAA member, to name a few, include:

- Addition of DAUAA membership to your résumé.
- Continuing involvement in defense acquisition activities and links to other professional organizations.
- Networking with other members of the Defense acquisition community through the Association membership Web site at <http://www.dsmcaa.org>.
- Timely updates on evolving Defense acquisition policies in Association Newsletters.
- Forum on initiating input to Defense acquisition matters through Newsletter and Symposium papers.
- Continuing Education Units (CEU) for DAUAA Annual Symposium participation—up to 2.5 CEUs—toward meeting DoD continuing education requirements.

- Promoting DAU's reputation as a world-class acquisition learning center, thereby enhancing value of education and training received.

Join this select group of professionals who are proud of their achievements as DAU-DSMC graduates, thankful for the skills and expertise they possess, and ready to make additional contributions to the security and progress of our nation.

Take advantage of this opportunity to help yourself and others. Call (703) 960-6802 to join DAUAA or complete one of the forms (opposite page). Mail it to the address shown. To learn more about DAUAA or register online using a credit card, visit the DAUAA Web site at <http://www.dauaa.org>.



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JUNE 17-19, 2002

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The Defense Acquisition University Alumni Association (DAUAA) will hold its 19th Annual Acquisition Symposium, June 17-19, 2002. In keeping with a tradition started last year, the DAU, in partnership with the DAUAA and various corporate sponsors, will also hold the second DAUAA Golf Tournament.

The Golf Tournament and Annual Acquisition Symposium will be held at Fort Belvoir, Va., on the following dates:

June 17
Second Annual DAUAA Golf Tournament: Shotgun Tournament followed by Golf Awards Dinner.

June 18
Registration, General Session, Keynote Address, Industry Displays, Speakers, Reception/Banquet

June 19

Registration, Industry Displays, Workshops, Association Annual Meeting and Luncheon, Panels



To register for this year's event or learn more about planned symposium events, go to <http://www.dauaa.org> on the DAUAA Home Page.



Aldridge, Stenbit Publish Clinger-Cohen Act Compliance Policy



OFFICE OF THE SECRETARY OF DEFENSE
WASHINGTON, D.C. 20301



MAR 8 2002

MEMORANDUM FOR SECRETARIES OF THE MILITARY DEPARTMENTS
CHAIRMAN OF THE JOINT CHIEFS OF STAFF
UNDER SECRETARIES OF DEFENSE
ASSISTANT SECRETARIES OF DEFENSE
GENERAL COUNSEL OF THE DEPARTMENT OF DEFENSE
INSPECTOR GENERAL OF THE DEPARTMENT OF DEFENSE
DIRECTORS OF DEFENSE AGENCIES

SUBJECT: Clinger-Cohen Act Compliance Policy

The Clinger-Cohen Act (CCA) of 1996 required the Department to appoint a DoD Chief Information Officer (CIO) and a CIO for each Military Department. The CIO's primary responsibility is to oversee investments in information technology (IT) (including National Security Systems [NSS]) to ensure that the Department's IT systems are interoperable, secure, properly justified, and contribute to mission goals. Additional legislative requirements for certification of Major Automated Information System (MAIS) compliance with the CCA and for registration of mission-critical and mission-essential IT systems have been imposed by recent DoD Authorization and Appropriations Acts.

Compliance with the CCA is required for all IT systems, including those in weapons and weapons systems programs. The requirement for certification of compliance with the CCA, as required by DoD Appropriations Acts, is limited to MAIS programs as explained in DoDI 5000.2. Registration requirements in the DoD Appropriations Acts are for mission-critical and mission-essential IT systems (including NSS).

The basic requirements of the CCA that relate to the Department's acquisition process have been institutionalized in DoD Instruction 5000.2. The purpose of this policy memorandum is to clarify and simplify the requirements for judging compliance with the law.

The requirements of DoD Instruction (DoDI) 5000.2 (paragraphs 4.7.3.1.5 and 4.7.3.2.3.2) regarding CCA compliance are modified as follows:

- a. Acquisition documents required by DoDI 5000.2 to support acquisition milestone decisions shall be used to address CCA requirements.

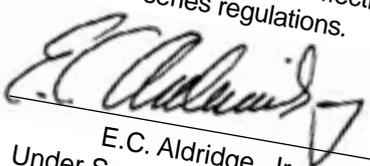


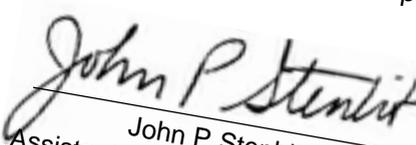
- b. The attached table illustrates the program-level documents that may typically be used to address individual CCA requirements. If those documents include specific CCA compliance information, Program Managers shall indicate CCA compliance by providing a table that (1) lists the requirements of paragraph 4.7.3.2.3.2 (subject to applicable exceptions in paragraph c below), and (2) specifically cites the page and paragraph (e.g., Acquisition Strategy, page 32, paragraph 4.1) in the program documentation where the requirement is satisfied.
- c. The following CCA requirements are presumed to be satisfied for Weapons Systems with embedded IT and for Command and Control Systems that are not themselves IT systems:

<u>CCA Requirement</u>	<u>Compliance Source</u>
(1) Make a determination that the acquisition supports core, priority functions of the Department	MNS approval
(2) Establish outcome-based performance measures linked to strategic goals	MNS, ORD and APB approval
(3) Redesign the processes that the system supports to reduce costs, improve effectiveness and maximize the use of COTS technology	Approval of the MNS, Concept of Operations, AoA and ORD

- d. The requirement for submission of written confirmation required by DoDI 5000.2, paragraph 4.7.3.2.3.2 shall be satisfied by the Component CIO's concurrence with the Program Manager's CCA Compliance Table.
- e. The requirement to register mission-critical and mission-essential IT systems in DoD 5000.2-R, Appendix 7, is amended as follows. For mission-critical and mission-essential IT that is an integral part of a weapons system or platform (e.g., ship, aircraft or tank), registration will be done at the program level.
- f. Issues relative to CCA compliance shall be resolved through the IPT process described in section 7, DoD 5000.2-R.

The above changes are effective immediately and will be included in the next update to the DoD 5000 series regulations.


 E.C. Aldridge, Jr.
 Under Secretary of Defense for
 Acquisition, Technology and Logistics


 John P. Stenbit
 Assistant Secretary of Defense for
 Command, Control,
 Communications & Intelligence

Editor's Note: Download the table referenced in this memorandum from the Director, Acquisition Initiatives Web site at <http://www.acq.osd.mil/ar/ar.htm#clingercohenmemo>.

DAU Welcomes New Commandant

Wynne Passes DAU Colors to Army Col. Ronald Flom

SYLWIA GASIOREK-NELSON

In a Change of Command ceremony held April 12 at Fort Belvoir, Va., Army Col. Ronald Flom assumed duties as Commandant of the Defense Acquisition University. Flom succeeds Army Col. (P) James Moran who served as DAU's Commandant from April 1, 2001, to April 12, 2002.

Flom comes to the University from Defense Contract Agency East, Boston, Mass., where he served as the Commander from September 1999 to April 2002.

Farewell to DAU Commandant
Guest speaker Michael Wynne, Principal Deputy Under Secretary of Defense for Acquisition, Technology and Logistics, began his remarks by acknowledging Moran's spectacular job in leading the University over the past 12 months.

"What Colonel Moran has led here at DAU over the past year is nothing less than the most comprehensive re-engineering of DoD acquisition training since DSMC was established in 1971," he said. "This change is critical to Secretary Aldridge's goal of revitalizing the quality and morale of the DoD AT&L workforce.

"DAU is the one institution," he continued, "that touches nearly every member of the workforce throughout all stages of their professional careers. This is where we revitalize our workforce



Michael Wynne (left), Principal Deputy Under Secretary of Defense for Acquisition, Technology and Logistics, passes the DAU colors to Army Col. Ronald Flom, who becomes DAU's new Commandant.

while ensuring it has the training it needs to make smart business decisions and deliver for our warfighters."

Wynne spoke in detail on two new courses added to DAU's curricula under Moran's leadership: PMT-401, Program Manager's Course, and PMT-352, Program Management Office Course. He said that over the past year, the University underwent a complete transformation in its curriculum, methods of delivering training, and in reorganizing its training sites. In just the past month alone, he noted, DAU stood up the two new courses—PMT 401 and PMT 352.

PMT-401

The Program Manager's Course (PMT-401), Wynne said, targets senior Level III-certified acquisition leaders with extensive acquisition experience. He noted that it departs from the traditional classroom and lecture setting and instead challenges and fully engages students through an intensive 10-week in-residence course built along relevant themes and real-world acquisition case studies.

PMT-352

Concurrently, Wynne added, DAU's Program Management Office Course (PMT-352), designed to provide Level III

Gasiorek-Nelson is a contract editor for Program Manager Magazine. She is employed by SRA International, Inc., Arlington Va.



“We have changed *how* we teach, *what* we teach, *where* we’re located, and *who’s* in charge—other than that we haven’t changed anything.”

**—Army Col. (P) James Moran
Former DAU Commandant**



From left: Army Col. (P) James Moran, outgoing Commandant; Donna Richbourg, Director, Acquisition Initiatives, Office of the Secretary of Defense; Wynne; Flom; and Frank J. Anderson Jr., DAU President.

certification for defense acquisition, introduces not only an overhaul of course content, but a complete rethinking on how that course material is delivered to the students. Combining both distance learning and in-residence training, Wynne said that this hybrid course takes advantage of the latest e-learning practices while ensuring material that lends itself best to presentation in a classroom stays in the classroom.

“It is through these two classes and others like them, which stood up under Colonel Moran’s leadership, that DAU is transforming its curriculum,” said Wynne.

He went on to note that one of Moran’s significant contributions in the execution of the DAU transformation plan is the collocation of DAU’s training sites, which he called Moran’s “greatest legacy”

as Commandant. On Wednesday, April 10, 2002, he noted, a ribbon cutting ceremony was held at the new DAU Mid-Atlantic Region campus at Patuxent River, Md. In March, he added, a similar ceremony was conducted in Huntsville, Ala., for the DAU South Region campus; and under construction now is another site in San Diego, Calif.

Borrowing a phrase from Col. Moran, Wynne said that DAU, with its new regional scheme, is now “in the foxhole with its customers,” and is now very close to the Services’ major systems commands.

“It [regionalization] will pay great dividends for both the University and its customers,” said Wynne. “It will also minimize the time our employees will have to spend traveling to training sites, time spent away from their families, and time spent away from their local workforce; and at the same time, DAU faculty will be close enough to the program offices to provide performance support while maintaining their currency,” he emphasized.

Remarking on the transformation during Moran’s tenure, Wynne said that changes of that magnitude are significant and not easy to bring about.

“As [Niccolo] Machiavelli stated, ‘There is nothing more difficult to manage, more dubious to accomplish, nor more

DAU CHANGE

APRIL 12, 2002,

Michael W. Wynne, Principal Deputy Under Secretary of Defense (Acquisition, Technology and Logistics), passes the DAU colors to Army Col. Ronald Flom. Flom became the new Commandant of the Defense Acquisition University during a Change of Command ceremony at the Defense Acquisition University on April 12, 2002, at Fort Belvoir, Va.



Moran (left) relinquishes his position as DAU Commandant, by symbolically passing the DAU colors to Wynne. Flom (right) stands by to receive the colors. Pratt stands at attention in the background.



Navy Senior Chief Boatswain James T. Pratt (right), DAU Senior Enlisted Advisor, presents the DAU colors to Army Col. (P) James Moran for the last time as Moran prepares to relinquish his command to Flom.



Pratt (right) prepares to post the DAU colors after receiving them from the new Commandant for the first time.



Distinguished visitors, from left: Retired Navy Rear Adm. Leonard Vincent, former DSMC Commandant; Claude Bolton, Assistant Secretary of the Army for Acquisition, Logistics and Technology and former DSMC Commandant; and Donna Richbourg, Director, Acquisition Initiatives, OSD.

OF COMMAND FORT BELVOIR, VA

Minutes before the ceremony, Army Spc. Normita Davisson adjusts Moran's portable microphone.



From left: Family friend, Mike Cassar; Jennifer Flom, daughter; Christine Flom, daughter; Flom; and wife, Kim.



Moran and wife, Patricia.



Flom's wife, Kim, escorted by Navy Cmdr. Scott Holden, departs the ceremony.

Patricia Moran (right) receives best wishes from Donna Richbourg, Director, Acquisition Initiatives, OSD.



Moran and wife, Patricia, receive best wishes from distinguished guest Claude Bolton, Assistant Secretary of the Army for Acquisition, Logistics and Technology and former DSMC Commandant.





“These are changing times in the transformation of DoD, the transformation of acquisition, and the transformation of DAU—and I'm happy to be part of that.”
—Army Col. Ronald Flom
DAU Commandant

doubtful of success than to initiate a new order of things,” Wynne said.

“It's been Colonel Moran's energy, commitment, and leadership that have been instrumental in bringing about this tremendous transformation in acquisition training,” he added.

An Exciting Time to be at DAU

“We have selected another strong leader who, together with DAU President Frank Anderson Jr., will provide con-

tinued energy and direction to the University,” Wynne told the audience.

“It is truly an exiting time to be at DAU; you have a critical mission to perform, you have great leadership, and a tremendous opportunity to positively impact the acquisition workforce. To both Colonel Moran and Colonel Flom, I wish you both the best of luck with your new assignments,” he said.

Concluding his remarks, Wynne presented Moran with the Defense Meritorious Service Medal for his superb leadership and direction as DAU's Commandant and Dean of the Defense Systems Management College-School of Program Managers.

It Takes a Team

In his last address as DAU Commandant, Moran told those assembled, “It takes a team effort—and we have a *great* team at DAU.”

Moran also stated that no organization has undertaken, in such a short period of time, the amount of transformation that has happened at DAU with the standing up of the new campuses, curriculum redesign, changing of the leadership, and both *how* and *what* DAU teach.

“We have changed *how* we teach, *what* we teach, *where* we're located, and *who's* in charge,” said Moran. Smiling, he added, “Other than that we haven't changed anything.”

Moran also noted that being able to achieve such transformation in only 12 months is certainly a testament to the dedication and professionalism of the members of the DAU workforce.

“I think I've been honored and blessed to be here. I know the challenge is hard and we certainly have moved quickly. I want to thank all of you for all the hard work you have done and for being team players about it,” Moran said.

Expressing gratitude to Anderson, Moran said, “I've been blessed and honored to have been your teammate. I

think the two of us —together—have made a *great* team.”

He also thanked Wynne and Donna Richbourg, Director, Acquisition Initiatives, Office of the Secretary of Defense, for allowing the University “to make all the changes needed to be done in the time frame that we've done it.”

From the New Commandant

Acknowledging that he was honored by his selection as DAU Commandant, Flom told those attending the ceremony that he is pleased to carry on with the course that Moran set for the future of the organization.

“These are changing times in the transformation of DoD, the transformation of acquisition, and the transformation of DAU—and I'm happy to be part of that,” Flom said.

Underscoring the importance of training, Flom said that he's been a product of defense acquisition training for the past 20 years or so, and that over the years he has been associated with many DAU customers. In fact, he acknowledged, the job that he just left involved association or interaction with about 6,000 defense acquisition professionals spread out among 31 commands and 650 sites in the eastern half of the United States.

“I understand what the challenges are in training the 140,000-member Defense acquisition workforce,” he said.

Noting that DAU is not only an academic institution, but also a business, Flom said, “We deliver products to our customers whether that product would be training, total learning solutions, research, curriculum development, or performance support.

“Colonel Moran has done an absolutely outstanding job—his are a large pair of shoes for me to fill. I'll do my best to continue the journey and to get us to the end of it,” he added.

Addressing the DAU family, Flom emphasized that DAU is a great place to



“DAU is the one institution, which touches nearly every member of the workforce throughout all stages of their professional careers. This is where we revitalize our workforce while ensuring it has the training it needs to make smart business decisions and deliver for our warfighters.”

**—Michael Wynne
PDUSD(AT&L)**

work. “Keeping this a great place and making this a place that people want to come to, not only to work but to get educated, is a top goal of mine,” he said.

Recognizing his wife Kim and his two daughters, Jennifer and Christine, Flom expressed appreciation for all they had to put up with over the years when he

was off doing things for the Army and Department of Defense.

“I’m looking forward to the challenge,” Flom concluded. “I can’t think of a better place to be today—in this time of transformation in DoD—and I’m very happy and fortunate to be able to be a part of it.”

COL. RONALD C. FLOM, USA *Commandant, Defense Acquisition University*

Colonel Ronald C. Flom became the Commandant, Defense Acquisition University, on April 12, 2002. Prior to assuming his current duties, Flom served as the Commander, Defense Contract Management Agency East, Boston, Mass., from September 1999 to April 2002; and as Commander, Defense Contract Management Command, Baltimore, Md.

Flom was commissioned a second lieutenant in 1974 upon graduation from the University of North Dakota with a Bachelor of Arts degree in Political Science. He also holds a Master of Science degree in Contracting and Acquisition Management from the Florida Institute of Technology, and a Master of Science degree in National Resources Strategy from the National Defense University. He is a graduate of the Industrial College of the Armed Forces, the Defense Acquisition University Senior Acquisition Course, the U.S. Army Command and General Staff College, and the Defense Systems Management College.

Flom served in command and staff positions in combat service support units in Korea and at Fort Campbell, Ky. He was assigned to



the Program Manager, M1 Abrams Tank Systems as the Operations Officer, and later as Chief, Production Support Branch, Lima Army Tank Plant, Lima, Ohio. After attending the Program Management Course at the Defense Systems Management College, he was

assigned to U.S. Forces Korea as the Chief, Small Purchase Branch, and subsequently as Chief, Contracting Division, U.S. Army Korea Contracting Agency. Flom served two tours of duty with the U.S. Total Army Personnel Command as Majors Assignment Officer in the Quartermaster Branch, and then as Chief, Military Acquisition Management Branch. He is a Joint Specialty Officer (JSO) and has served three joint tours with the Defense Logistics Agency.

Flom’s awards and decorations include the Defense Superior Service Medal, the Defense Meritorious Service Medal with oak leaf cluster, the Meritorious Service Medal with four oak leaf clusters, and the Army Commendation Medal with oak leaf cluster. He is also authorized to wear the Air Assault Badge.

He and his wife, the former Kim, Kil Sun of Mokpo, Korea, have two daughters.

The Value of Science and Technology

Beyond Full-Scale Production and Deployment

GREG MANNIX

Throughout history, technology advances have long proven to be a cornerstone of combat superiority. Likewise, advanced technology and equipment have proven their worth throughout DoD as decisive force multipliers in fighting and winning the nation's wars and conflicts.

Consider the advent of the automatic rifle, precision guided weapons, as well as modern aviation—each earned a unique place in military history, and each relied on leaders willing to reap the benefits of state-of-the-art technology while accepting the risk of venturing down new paths.

The defense acquisition process has traditionally viewed Science and Technology (S&T) activities to be a forerunner throughout early programmatic phases (i.e., concept exploration, program definition and risk reduction, engineering and manufacturing development), but marked by sharp withdrawal upon entering full-scale production.

Today's rapidly growing technologies seemingly emerge at a rate far exceeding typical weapon system life cycles, thereby exacerbating the potential for lost or severely delayed opportunities for increased performance, force effectiveness, and ultimate combat superiority. Yet, these same opportunities are increasingly embraced by those who would harm our nation in the form of increasingly emerging asymmetrical threats.

S&T Throughout the Life Cycle
Leveraging of Science and Technology throughout the system's life cycle, beyond deployment, has traditionally occurred out of necessity. Improvements to platforms such as the B-52 Bomber, M113 Armored Personnel Carrier, and F/A-18 have centered on the need to maintain these platforms as viable and effective against modern threats, even though they are well beyond their originally intended life cycle.

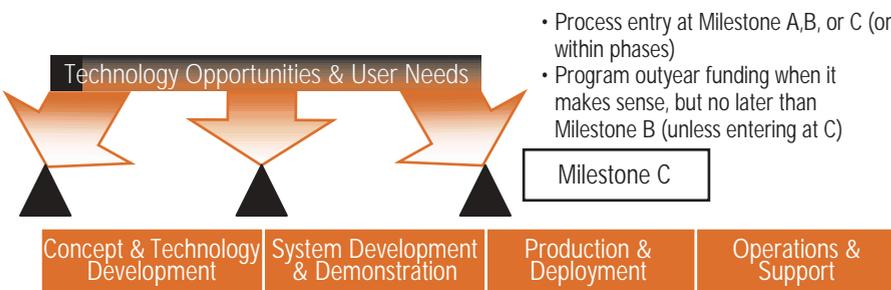
The benefits of planning and implementing S&T activities throughout the

life cycle, with increased emphasis on post full-scale production and deployment, will certainly improve our ability to transition enabling technologies to specific military systems at a much increased rate and depth. Conversely, it would be disadvantageous to reach into S&T only upon realization that a deployed system's capability has degraded or is challenged by a new threat.

The Acquisition Model
Today's acquisition process (Figure 1), established by a revised DoDD 5000.1 on Jan. 4, 2001, depicts the application of "Technology Opportunities and User Needs" throughout Concept and Technology Development and System Development and Demonstration, concluding at the Milestone C (MSC) production decision.

Fully realizing the benefits of emerging and advanced technologies throughout a given system's life cycle will require planning and implementing S&T activities beyond MSC. Such an approach is illustrated in Figure 2.

FIGURE 1. The 5000 Model



Mannix is Project Director for the Precision Guided Mortar Munition at the PM Mortars, PEO Ammunition, Picatinny Arsenal, N.J. He holds a Bachelor's of Science in Mechanical Engineering and has served the U.S. Army Armament Research, Development and Engineering Center (ARDEC), U.S. Army Simulation, Training and Instrumentation Command (STRICOM), and Headquarters Department of the Army (HQDA) Staff.



This methodology may be viewed as a defense system specific path to achieving “Continuous Quality Improvement”—a customer-focused means of pursuing dramatic changes over time, identified by Michael Brassard and Diane Ritter in *The Memory Jogger*.

Acquisition programs structured

This acquisition management approach had been studied by the Australian Defence Organisation for procurement of complex systems, as reported by Derek E. Henderson and Andrew P. Gabb, in their March 1997 article, “Using Evolutionary Acquisition for Procurement of Complex Systems.”

The U.S and Australian Evolutionary Acquisition approaches share a common vision based on time-phased requirements and block upgrades, with a

Legacy Systems and Traditional Acquisitions

The continued effectiveness and superiority of legacy systems cannot be underestimated. These systems and ongoing traditional developments may certainly benefit from advanced technology well into the system’s life cycle.

Pre-Planned Product Improvement (P3I) and Modernization Programs have proven to be successful techniques in translating current technology to such

DoD’s leveraging of Science and Technology throughout a system’s life cycle, beyond deployment, has traditionally occurred out of necessity.

ured in this manner are readily supported by a host of practical defense program management tools highly encouraged in today’s acquisition environment of innovation. Noteworthy Evolutionary Acquisition strategies that recognize time-phased requirements, rapid initial military capability deployment, subsequent development, and block upgrades will surely rely heavily upon S&T beyond Initial Operational Capability.

Program Management Tools

EVOLUTIONARY ACQUISITION, BLOCK UPGRADES, AND OPEN SYSTEM DESIGN

The Deputy Secretary of Defense has identified Evolutionary Acquisition as “the preferred approach to satisfying operational needs” in his introduction to DoDD 5000.1, Jan. 4, 2001.

reliance on open system designs. Notably, DoDD 5000.2R requires that program managers (PM) use an open systems approach to:

- Adapt to evolving requirements and threats.
- Accelerate transition from science and technology into acquisition and deployment.
- Maintain continued access to cutting-edge technologies and products.

Critical to the open systems design approach is the use of modular design and standards-based architectures accompanied by well defined interfaces. To facilitate technology insertion and evolutionary upgrade throughout the total system’s life cycle, Michael Hanratty, Robert Lightsey, and Arvid Larson, in their January 1999 article, “Open Systems and the Systems Engineering Process,” identified key tenets of open system design processes. As open system designs reach the warfighter, the vitality of S&T beyond full-scale production will be increasingly obvious as Block 1 hardware reaches obsolescence.

systems. A variety of techniques are available to identify appropriate technology for P3I/Modernization Programs. A pivotal first step may entail laboratory or field demonstration in assessing technology readiness levels and establishing P3I/Modernization Programs for deployed systems.

Technology Transition Mechanisms

The Joint Warfighting S&T Plan offers specific processes to promote the transition of innovative concepts and superior technology to the user. Foremost, this plan recommends the pursuit of Advanced Technology Demonstrators (ATD), Advanced Concept Technology Demonstrators (ACTD), and Experiments to bring technology to application. These methods make transition efforts visible and often require a level of commitment among PMs, government laboratories, and contractor teams.

Novel and less formal transition methods may also bear fruit. Informal efforts may be more liberally structured in pursuit of technologies offering significant

HORIZONTAL TECHNOLOGY INSERTION

Ammunition provides unique opportunities for Horizontal Technology Insertion because it continues to be reprocedured throughout its life cycle, long past its initial deployment. PM Mortars, which has the advantage of managing an extensive ammunition family, leverages its high-volume repro- curement program to accomplish evolutionary product improvements to mortar ammunition.

One recent ammunition upgrade, which significantly applied S&T to Full-Scale Production, was the 60mm High Explosive (HE) Insensitive Munitions Program. This program qualified a new, developmental, insensitive explosive (named PAX-21 after the Picatinny Arsenal site where it was developed), to replace highly sensitive Composition B, resulting in significant improvements in performance on DoD Insensitive Munitions standards. The new M720A1 60mm HE round, which also incorporated a more lethal high-fragmentation shell body and an updated version of the electronic multi-option fuze M734A1, was type-classified in November 2001, and entered production immediately.

Patricia L. Felth
Deputy Product Manager

GAO REPORT RELEASED

Acquisition Workforce: Department of Defense's Plans to Address Workforce Size and Structure Challenges

The General Accounting Office (GAO), the investigative arm of Congress, has reported to Armed Services Committees of the Senate and House of Representatives that DoD has made progress laying a foundation for reshaping its acquisition workforce.

The report (GAO-02-630), dated April 2002, specifically examines the reported status of DoD's efforts to respond to recommendations made by the Acquisition 2005 Task Force. The Task Force made a series of recommendations to DoD in October 2000, and on March 1, 2002, in response to a mandate in the National Defense Authorization Act for Fiscal Year 2002, DoD reported on its plans to implement recommendations made by the Task Force.

According to the GAO Report, DoD views implementation of many of the recommendations as long-term efforts with specific outcomes taking years to achieve.

Read the entire GAO report from the GAO Web site at <http://www.gao.gov>. To view the Acquisition 2005 Task Force Report, go to <http://www.acq.osd.mil/yourfuture/story.htm#reports>.

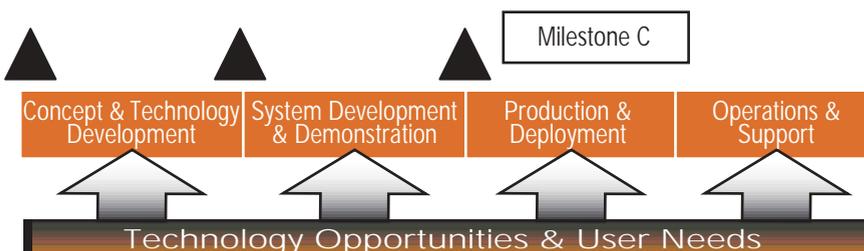
performance gains at the subsystem or component level. Laboratory demonstrations and user/field demonstrations outside the formal ATD/ACTD structure often become inflection points, spawning product improvement programs and system upgrades.

Logisticians and life cycle support contractors often grasp technology improvements out of sheer necessity in maintaining deployed systems where system or product components/materials are no longer available for resupply. Interaction with users and logisticians provides invaluable insight to potential technology gaps and corresponding technology transition points for deployed weapon systems.

Realizing the Benefits of S&T
Exploiting S&T beyond full-rate production and deployment has consistently proven invaluable to providing our military forces superior defense materiel. Project managers may realize the total benefits of S&T beyond full-scale production and deployment by planning for S&T throughout the system's life cycle and embracing management techniques centered on evolutionary acquisition, block upgrades, open systems designs, P3I and Modification Programs, coupled with formal and informal technology transition methods.

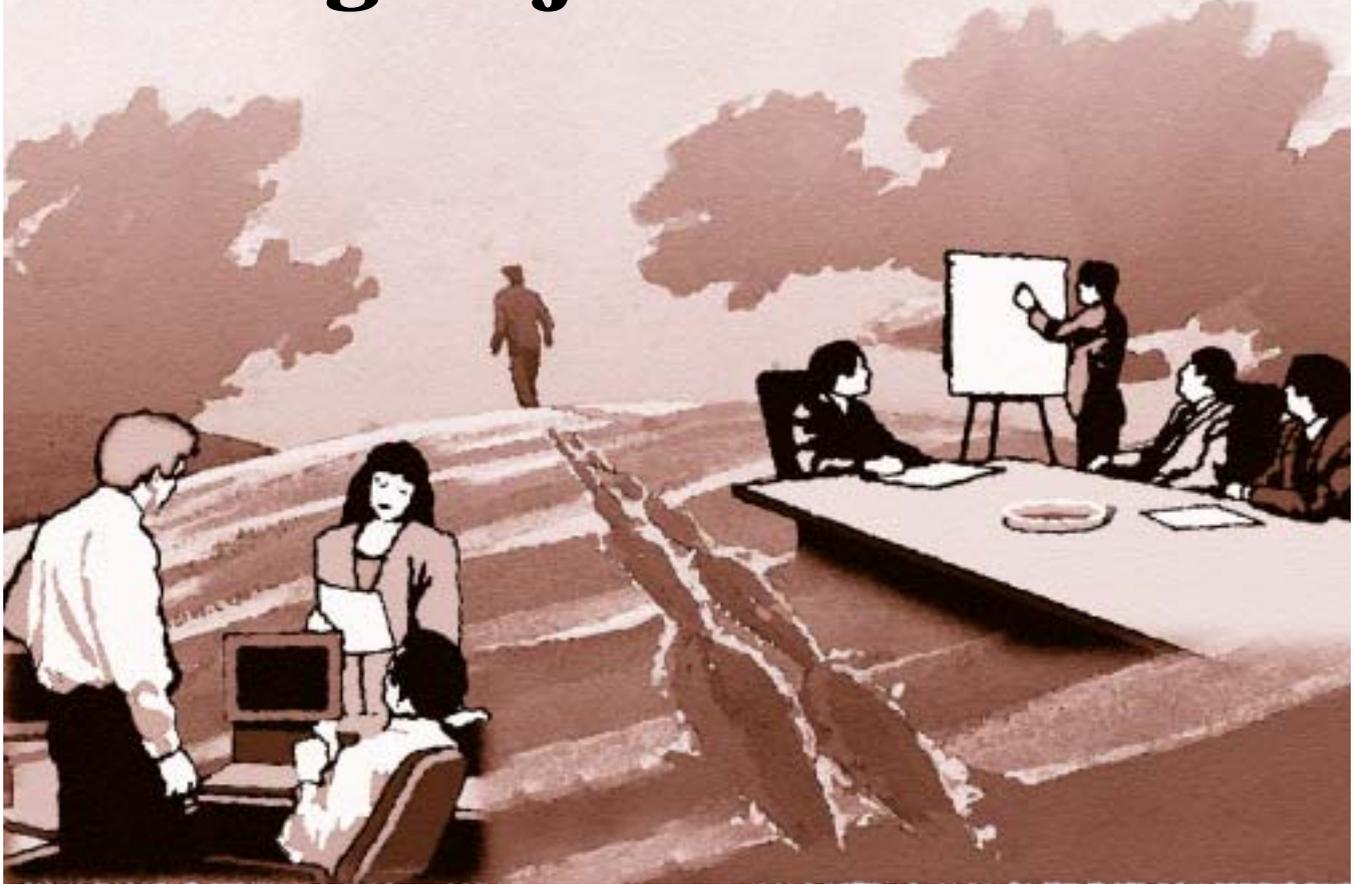
Editor's Note: The author welcomes questions or comments on this article. Contact him at gmannix@pica.army.mil.

FIGURE 2. S&T Activities Beyond Milestone C



Arrange for an Offering of DAU's New:

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CALL NOW!

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Keeping JSF on Track is Top Priority for Test Force

LEIGH ANNE BIERSTINE

EDWARDS AIR FORCE BASE, Calif. (April 1, 2002)—The first Joint Strike Fighter [JSF] demonstration aircraft is still more than three years from touching down here, but test experts planning for the arrival say it is just around the corner.

The JSF Integrated Test Force is a mere five months into the 10-year system development and demonstration program, with the first test aircraft expected to arrive in October 2005.

Plans call for five Air Force JSF variants to be based here for developmental testing, along with three transient aircraft from Naval Air Station Patuxent River, Md. Both the Air Force and the Navy will conduct testing on all of the JSF variants, including the Air Force, Navy, and Marine versions and the United Kingdom's version. An additional 18 aircraft are expected to arrive once the program moves into operational testing in 2010.

Defense officials from the United Kingdom [U.K.] have recently decided to conduct operational tests of the U.K. version of the JSF, said Joe Dowden, Director of the JSF Integrated Test Force. Initial plans call for two U.K. aircraft and support crews to be based here during the later portion of the demonstration program.

Dowden said the test force is already picking up the pace.



Joe Dowden (right), Director of the Joint Strike Fighter Integrated Test Force at Edwards Air Force Base, Calif., and Mark Crawford, JSF Chief Engineer, use a model of the fighter to demonstrate steps they are taking to keep its development on track. The Edwards test force is working with counterparts from the Navy and the United Kingdom to build one integrated test plan that will be responsible for evaluating three different versions of the fighter aircraft. Photo by Carlos Rolon

“Keeping the test program on track at this early stage is a top priority,” Dowden said. “We want to field these aircraft as quickly as possible to replace aging aircraft in the Air Force as well as in the Navy and Marine inventories,” he said.

The JSF test program is unique in that three different versions of the same aircraft will be tested using the one integrated test plan, said Mark Crawford, Chief Engineer for JSF. This means the test force is working closely with an expanded group of test partners from around the world.

Crawford points out that such an arrangement presents more of a communications challenge for the test force; however, he said that having one plan is still more efficient for the Air Force than conducting three separate test programs.

"The military services have traditionally built unique aircraft to fulfill their different missions," he said. "By building and testing common aircraft and systems, we can gain a significant economy in terms of the size of the test team, effort, and overall cost. You will see more people here than for a single aircraft test program, but many less than you would for three separate programs."

Dowden and Crawford agree that coordinating with testers throughout the Department of Defense and the world to develop the JSF makes early planning a must. One challenge for the test force is to plan ahead for any potential security issues that may arise when foreign nationals begin arriving here to assist with JSF testing. Dowden expects five to 10 U.K. testers to be based [at Edwards] for developmental testing with a potential buildup of 40 to 70 U.K. personnel supporting operational tests.

"It's important that we work to gain clarification on our heightened security policies, so that we can integrate the U.K. experts into our workforce," Dowden said.

Nearly 20 engineers from Edwards are working alongside software and hardware designers at Lockheed Martin in Fort Worth, Texas, to design the fighter's flight controls, avionics, and weapon systems. Many of these subsystems will be evaluated in

various stages of integration before they are incorporated into the aircraft.

"It is much easier and cheaper to fix problems if you can find them in the early stages of development," Crawford said. "Working on these subsystems now makes us better testers downstream, because we will better understand the system once it arrives at Edwards."

Crawford said that having developmental testers involved from the start will help save the JSF program money down the road.

"If you've got 20, 30, or 500 aircraft rolling off the line and you start finding problems, it costs a lot of money to go back and fix those systems," he said. "If you can come up with those fixes before you produce an aircraft, you save a lot of money over the life cycle of the aircraft."

The test force is bringing in a cadre of engineers and logistics experts to support the test planning effort. By the end of the demonstration program, the JSF test force here is expected to grow to more than 1,000 people.

"It seems like we have a lot of time before our first flight, but with so many people coming together to build one integrated plan, we have to start early," Crawford said. "Three years and eight months is going to fly by."

Editor's Note: Bierstine works in the Public Affairs Office at the Air Force Flight Test Center, Edwards AFB, Calif. This information is in the public domain at <http://www.af.mil/news/Apr2002/>.

Commercial or Non-Developmental Item Acquisition Strategy

A Look at Benefits vs. Risks

PAUL D. GUTIERREZ

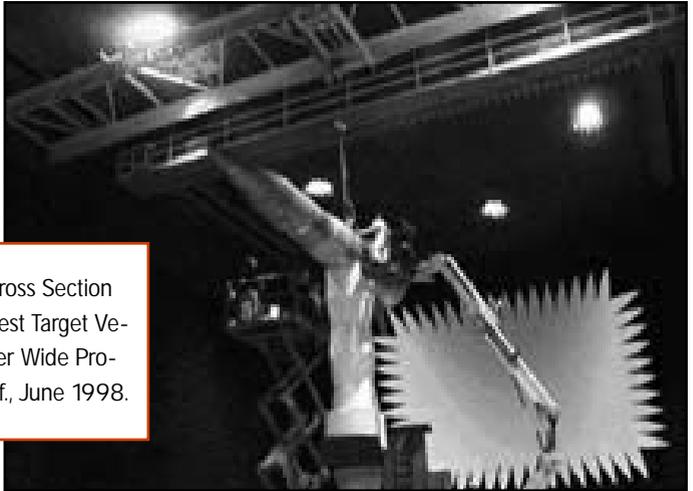
Throughout the Department of Defense (DoD), Operations and Support costs are rising, with fewer and fewer dollars available for research, test and evaluation, and procurement of new systems. To save scarce resources and minimize the dollars spent on seemingly unnecessary test and evaluation, DoD is increasingly turning to three categories of procurement for needed products, services, and systems: Commercial Item (CI), Non-Developmental Item (NDI), and Commercial Off-the-Shelf (COTS). This article examines the wisdom of that strategy and its ramifications.

First, let's examine exactly what the three categories represent to the prospective government buyer.

CI

On June 26, 2000, the Office of the Secretary of Defense (OSD) defined a Commercial Item in their report, *Commercial Item Acquisition: Considerations and Lessons Learned*, as one customarily used for non-government purposes that has been or will be sold, leased, or licensed (or offered for sale, lease, or license) to the general public. An item that includes modifications customarily available in the commercial marketplace or minor modifications made to meet Federal Government requirements is still a Commercial Item.

In addition, services such as installation, maintenance, repair, and training that are procured for support of an item, as described here, are considered Com-



Performing Radar Cross Section Measurements for Test Target Vehicle-3, Navy Theater Wide Program, Pt. Mugu, Calif., June 1998.

mercial Items if they are offered to the public under similar terms and conditions or sold competitively in substantial quantities based on established catalog or market prices.

NDI

A Non-Developmental Item is any previously developed item of supply used exclusively for government purposes by a Federal Agency, a state or local government, or a foreign government with which the United States has a mutual defense cooperation agreement; and any item described here that requires only minor modifications or modifications of the type customarily available in the commercial marketplace in order to meet the requirements of the processing department or agency.

COTS

In the same June 2000 report, OSD defined a COTS item as one that is sold, leased, or licensed to the general pub-

lic; offered by a vendor trying to profit from it; supported and evolved by the vendor who retains the intellectual property rights; available in multiple, identical copies; and used without modification of the internals.

Why the Shift to CI, NDI, and COTS?

With fewer dollars available for research, test and evaluation, and procurement of new systems, an important advantage of many CI and NDI acquisitions is the reduced acquisition cycle time. This reduction results primarily from decreased design and engineering time, but is partially achieved through decreased testing requirements—a situation made possible only because of previous testing and general acceptance of the product in the commercial marketplace or in a previous military application.

The general guidance for CI and NDI acquisitions is to conduct testing only

Gutierrez is a professional engineer and is currently assigned as the Sea Based Mid-Course (SBMC) Mission Manager, Space and Missile Defense Command, Huntsville, Ala.

when existing data (contractor or other) is insufficient. Likewise, Developmental Test and Evaluation—which is Test and Evaluation conducted throughout the life cycle to identify potential operational and technological capabilities and limitations—is conducted only if specific information that cannot be satisfied by existing data is needed.

Involve the Experts Early
Important to the health of any program or project is obtaining assistance from the developmental testing experts—*early* in the life cycle. Early participation by each Service's independent Operational Test Agency is equally important. Together, these testers can verify existing test data and plan for additional tests if required. Since the product is already developed, most testing of CIs is Operational Test and Evaluation, which involves the field test, under realistic conditions, of any item (or key component) of weapons, equipment, systems, or munitions for the purpose of determining its effectiveness and suitability.

Counting the Cost

While most technology decision makers hail DoD's move toward using COTS components in advanced weapon systems, a wary and experienced minority in the defense community is warning that using commercial products can be expensive and inefficient. The acquisition cost savings are not being realized to the extent anticipated because of many factors not included when the product was procured.

Early Warning

In September 1997, the Department of Defense Office of the Inspector General (DoDIG) issued Audit Report No. 97-219, "Lessons Learned from Acquisitions of Modified Commercial Items and Non-Developmental Items." Detailing lessons learned from the acquisition of modified CIs and NDIs, the report went on to cite 37 DoD programs that acquired modified CIs and NDIs in anticipation of substantial cost savings.

Also in the report, the DoDIG noted that to remain competitive, commercial suppliers often retained proprietary rights

While most technology decision makers hail DoD's move toward using Commercial Off-the-Shelf (COTS) components in advanced weapon systems, a wary and experienced minority in the defense community is warning that using the commercial products can be expensive and inefficient.

to technical data that affect or describe product performance, quality, and logistical support. Program Offices were attempting to side-step testing in order to save funds, but subsequently discovered that they had to go back and test the items anyway.

Ultimately, the Program Management Offices (PMO) found that they could not avoid component and integration testing just because the item was commercial. In fact, in cases where PMOs elected to procure CIs, such items now raised eyebrows and the users wanted more testing because the items were being used by the military in environments for which the commercial producers had not intended.

Invariably, we in the test community have found that contractors, vendors, and suppliers have in fact done very little testing of such items. For purposes of this article, a contractor is a company or institution that is under contract to the government and from whom a program manager expects to receive a delivered system as specified in a contract.

A contractor may also be a vendor. A vendor is a commercial enterprise whose purpose in producing a product is to offer it for sale in the marketplace, and not in response to specific program needs. The vendor may also be a contractor or subcontractor who is under contract to modify a CI in response to unique program requirements.

COTS Solutions Not Always the *Best* Solutions

Let me recount a partial list of problems encountered by NASA's Jet Propulsion Lab, as documented by Advanced Program Management Course student Wilson Dizard III, in his September 2001 "COTS Skeptics Cite Risks in Commercial Software."

NASA purchased COTS items as a quick and inexpensive design solution, but their experience has shown that commercial vendors do not bend to the demands of their military customers. From their experiences emerged the following misconceptions about COTS and COTS vendors—misconceptions that those responsible for procurement may be harboring to their detriment:

- COTS package solutions are less risky.
- Buying and Modifying a COTS package is faster than developing a new item, system, or technology.
- A COTS package is already available for my application.
- A COTS package will work because copies abound in other organizations.
- The vendor will keep the COTS package current.
- Vendor literature is always factual and true.

NASA eventually found that they were buying "black boxes" with little information. Lesson Learned: Not *all*, but definitely *some* COTS packages are questionable and can create problems for one or more of the following reasons:

- Vendors overcommit themselves.
- Vendors don't supply all services.
- The software may not meet the requirements.
- The software may not be easy to modify.

- The purchaser has very little control over vendor quality and schedule.

Because of these five discrepancies, the PMO organization may have to change to accommodate the COTS package. NASA experienced increased support costs for modifications that were as high as 20 percent of the cost of the modification per year.

CI/NDIs Also Not Without Problems

CIs and NDIs are also fraught with potential problems for PMs. While they are encouraged to purchase CIs and NDIs in today's acquisition environment of streamlining and Milspec Reform, PMs may not fully realize that much testing remains to be done prior to any proposed military application.

Early qualification testing will probably be required in the operational and maintenance environment. Pre-production qualification testing will be required if early qualification testing leads to modification of the original item. Ideally, PMs should perform market research prior to purchasing, and put the item in users' hands early to determine if the users can work with the items in their operational environments.

COTS Testing Without Full Disclosure

How do we test COTS if the vendor does not release information? It's true we can buy a COTS package more quickly than developing it, but we may not get all the literature with the package. The COTS package is difficult to modify. If it's not "plug and play," the PMO may wind up spending huge sums to test the package and ultimately get it to work.

Cases are known, where small vendors might not support revisions that are even four releases old. DoD must then keep purchasing upgrades and retesting. The result: our configuration becomes unstable. Trapped by contradictory conditions, a Catch-22 situation is the likely result as the PMO starts spending more money in an attempt to keep up with all the releases. The user becomes unhappy if the COTS is not tested, we find

The use of CIs frequently meant embracing commercial business practices that are embedded in the CI. As a result, the vendor may not have full knowledge of how the item works.

interface problems, and it is difficult if not impossible to modify the items.

To be effective, the PMO must choose the correct standards and the correct components. Can the PMO later change from one vendor's components to a second vendor's components? Perhaps the interfaces could be incorrect, rendering it impossible to make such a change. And if we do change, it could be very costly as well as time consuming to the program.

The pitfalls that beset COTS may also hold true for CIs and NDIs. The bottom line is that PMs must continue to test CIs and NDIs, even though they are commercial items. The big push is to accept the items "as is" and avoid testing them, but we now have DoDIG and NASA reports highlighting the fact that CIs may require extensive testing.

Let's Not Forget Developmental Test and Evaluation

The use of CI, COTS, and NDI acquisitions was intended to reap huge savings for the government; however, the PMOs cannot afford to forget another important aspect of such acquisition—Developmental Test and Evaluation. The use of CIs frequently meant embracing commercial business practices that are embedded in the CI. As a result, the vendor may not have full knowledge of how the item works. The concept of operation; interface and data standards; ar-

chitecture and design; and the characteristics of form, fit, and function—all can generate additional problems.

Equally important are the vendor's business practices and strategies in areas such as development, maintenance, distribution updates, and availability of spare parts. To maximize the item's effectiveness in meeting program needs, many DoD requirements must be adjusted to accommodate both the vendor's anticipated uses of the CI and the vendor's business practices.

To summarize the points I make in this article, let me provide a few test and evaluation recommendations that I hope would merit any PM's earnest consideration:

- Buying organizations should thoroughly analyze known deficiencies of commercial equipment, NDI, and COTS before purchasing the items.
- PMOs should plan the conduct of operational testing as early as possible. This will identify problems early and allow resolution as soon as possible.
- PMOs have to recognize that test and evaluation of commercial components is important when commercial suppliers are modifying a commercial system. Vendors do not test their items in military environments.
- Buying organizations should develop a sensible test program using previous manufacturing and government test results.
- PMOs should tailor their testing to address program risk areas.
- Test organizations should maintain on-site representation during test execution to ensure test requirements are met and the test results are understood. PMs cannot totally avoid testing just because they have purchased CI for military use.
- PMs can still realize cost savings using CIs if they use common sense about testing the items.

Editor's Note: The author welcomes questions or comments on this article. Contact him at paul.gutierrez@smdc.army.mil.

Procurement Chief Seeks "Best Product at the Best Price"

GERRY J. GILMORE

WASHINGTON, March 26, 2002—The Defense Department is adopting the latest technology and private-sector business practices to provide U.S. troops with "the best product at the best price," DoD's senior procurement officer said March 8.

Deidre A. Lee, Director of Defense Procurement, said ongoing modernization of DoD's contracting and procurement systems has the dual benefit of enhancing national security and saving taxpayer dollars. Lee is responsible for the implementation of procurement and contracting policies involving more than \$130 billion of annual business.

As an example of change, Lee said DoD once used an inefficient, slow, and costly drug warehousing system. To transform the way DoD conducts its pharmaceutical business, she said, defense officials looked to private-sector practices.

"Defense Logistics Agency stepped back and said, 'OK, how does the commercial entity do this?' How do hospitals and doctors around this country manage this supply?" Lee said.

DoD now buys pharmaceuticals and shipping service on a "just in time" basis so customers get what they need when they need it, she explained. That means no stockpiling and no overhead needed to maintain warehouses.

"We're still buying," Lee noted, "but we're buying more of a service. That quicker delivery of product, of course, generally results in a lower price, and certainly, a more modernized process."

This way, Lee said, warfighters and other DoD customers "get pharmaceuticals that are well-managed, the latest, properly shipped and properly maintained. That's a better way of doing business," she noted.

Technology, Lee emphasized, is playing an ever-expanding role in contracting proposals and selections, contractor-customer communications, payments, and the timely delivery of products and services to customers.

For example, she saluted procurement specialists for doing an "exceptional job" in quickly fielding the Joint Direct Attack Munition, a 1,000- or 2,000-pound iron bomb given a guidance package that relies on inertial navigation and global positioning systems. Kits

used to convert bombs in the field weigh about 100 pounds and cost about \$18,000.

Lee described the JDAM development program as "highly successful," because it was accomplished quickly—less than three years—and produced a highly affordable weapon. The estimated average cost of the first 40,000 units is less than half the target price specified in the initial requirements document for the program, she said.

Besides its relative low cost, JDAM's performance has been excellent, as evidenced by its extensive, successful use in Afghanistan. DoD has accelerated production of the weapons to ensure adequate numbers are available.

DoD worked closely with contractors during JDAM's development, Lee noted. It fast-tracked development by encouraging the contractor to use appropriate commercial specifications, parts, and quality systems, she explained. DoD insisted low cost be a major consideration in the design process, she said.

Lee added that DoD required from the outset that the precision-guided munition be developed with the Navy and Air Force in mind so both Services' aircraft could use it.

"It's incredible, as we watch what's happening in Afghanistan, what our weapon systems [and] the people behind them can and do accomplish," she said.

Lee praises DoD's contracting and procurement people. "They know how things work, they know how things should work, and they have great ideas on how to improve them," she emphasized.

Regarding new ideas, Lee noted that DoD has received more than 12,500 responses inside and outside government to its Broad Agency Announcement last October seeking ideas and concepts that could be quickly implemented to fight terrorism.

Every BAA response is being reviewed, Lee said, adding that some suggestions involve methods to locate difficult military targets. Some ideas, she added, have already been identified for further discussion.

"And, there are a few that are already at the level where we think we'd like to fund them," Lee concluded.

Editor's Note: This information is in the public domain at <http://www.defenselink.mil/news>.

Project Managers as Leaders

Self-Assessment Can be Painful, But Well Worth the Journey

KEITH LYMORE

"It is not important what you are going to do, but what you are doing now."

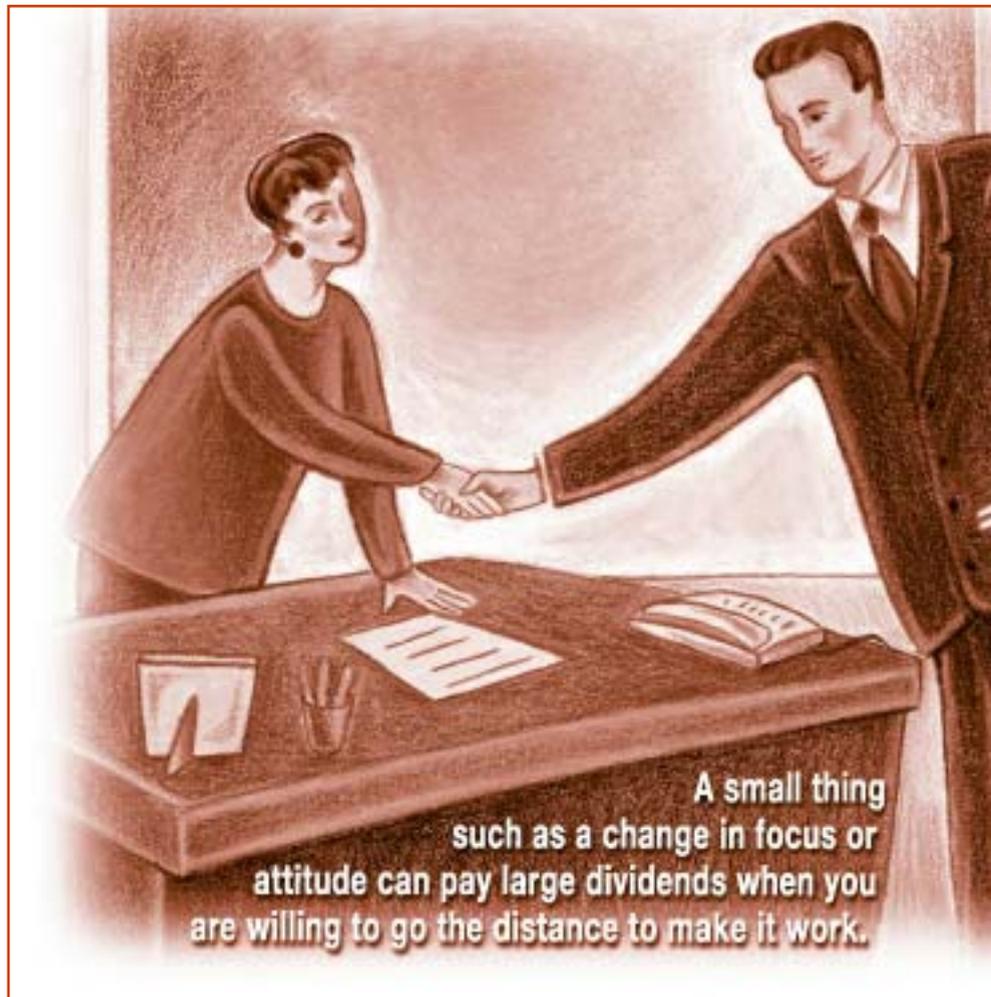
—Napoleon Hill

This article was written as part of the graduation requirements for the Advanced Program Management Course (APMC), at the Defense Systems Management College (DSMC), Fort Belvoir, Va. APMC is the Defense Acquisition University's premier acquisition course, and is the capstone course for new program managers. Fourteen weeks in duration, the course provides insight into new regulations, dissemination of new techniques from across the Services, and an opportunity to develop professional relationships with members from all three Services.

What Weaknesses?

Initially, the tasking to identify the weaknesses in my management style and then come up with a plan to resolve those weaknesses was a little overwhelming. Typically, very few among us are willing to admit that we even have any weaknesses, let alone trying to identify ways to improve upon them. So at this point I was floundering and searching for the life vest—*until* we began our study of Program Management and Leadership.

A key portion of the block of study was the Defense Project Manager Research Study (DPMRS), authored by Dr. Owen Gadenken, a professor of Engineering Management at DSMC. Gadenken's study included interviews with over 900 individuals. The individuals interviewed were program managers, functional managers, and project management ex-



A small thing
such as a change in focus or
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are willing to go the distance to make it work.

ecutives from various services at DSMC, the Naval Postgraduate School (NPS), and the Air Force Institute of Technology (AFIT). Specifically, what intrigued me was the block that discussed attributes typical of the best PMs:

- Are strongly committed to their mission.
- Have a long-term and big-picture perspective.
- Are both systematic and innovative thinkers.
- Find and empower the best people for their project team.
- Are selective in their involvement in project issues.
- Focus heavily on external stakeholders.
- Thrive on relationships and influence.
- Proactively gather information and insist on results.

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"The greatest of all miracles is that we need not be tomorrow what we are today, but we can improve if we can make use of the potential implanted by God."

—Rabbi Samuel M. Silver

Steps to Success

Insight renewed, I began formulating and outlining my paper to incorporate attributes of the best program managers. As I worked to produce a final cut of



my paper, some attributes more than others seemed to cry out for attention. At this point, I decided that my paper would be a multifaceted effort, best approached by following six specific steps:

- In Step 1, I would seek out the author of the DPMRS to gain a better appreciation of what he had found.
- Step 2 would be to identify a couple of PMs on campus who have obtained

some measure of success and interview them about their careers. Admittedly, interviewing only one or two individuals on campus would in no way validate or invalidate the earlier results of the DPMRS. Through the interviews, I hoped to identify some of the attributes listed in Gadeken's study. By taking this step, I would be validating, in my own mind, that the attributes were valid.

- Step 3 would be a visit to DAU's Acker Library to review items already published by various authors on leadership, further augmenting my knowledge base on the topic of leadership.
- Step 4 would be to review my PROFILOR results to determine my personal strengths vs. weaknesses. The PROFILOR is a 360-degree instrument developed to provide feedback and development focus, as well as recommendations to individuals about their management skill strengths and development needs. Under the PROFILOR assessment, feedback surveys are completed by your superiors, peers, and direct reports.
- Step 5 would follow once I had a firm grasp of my strengths vs. weaknesses. I could then begin to develop a plan to, first determine how I can more fully leverage the strengths that I already exhibit; and second, develop a plan to strengthen my identified weaknesses.
- Step 6, the last step, would be to document the whole process and complete the assigned paper.

"Things turn out the best for the people who make the best of the way things turn out."
—John Wooden

Step 1

I began Step 1 by meeting with Gadeken, the primary author of the DPMRS. We had lunch and talked about the study and how he went about accomplishing it. Gadeken provided me with a number of additional articles, along with the digital files for some of the data from the DPMRS.

One article in particular, "Project Managers as Leaders; Competencies of Top Performers," *Army RD&A*, January-February 1997, discussed an article in the August 1988 edition of *Training* magazine.

Two researchers were trying to determine what makes University of Alabama coach Paul "Bear" Bryant such a great coach. Instead of writing up their notes, they decided to watch him in action with his players. What they found was that he didn't do most of the things he alluded to in the interviews. However, they discovered other behaviors such as detailed observation of player performance and immediate feedback, which actually accounted for Bryant's successes.

Essentially, they found that "exemplary performers differ very little from average ones, but that the differences are enormously valuable."

For instance, last year a famous shooting guard in the National Basketball Association (NBA) was considered a spoiled, rich, ball hog who would never lead his team to an NBA Championship. Now, a year later, his praises are being sung from shore to shore, about how he led a team of unknowns to the brink of winning an NBA Championship. Upon investigation, little has changed over that year, except his *attitude*.

Last year, he would continually complain about the officiating, his teammates, his coach, and his off-court run-ins with the law. Then there were his tattoos, his hip-hop dress code, and his unorthodox training regimen.

Late last year, however, on the brink of being traded to another team, he realized that he needed to make a change or this would be the end for him. That same year, he dedicated himself to doing everything that his coach asked him to do—to be the first one at practice and the last one to leave each day; to stop complaining about the referees or his teammates; and to apologize for some of the things that he had said in the past.

This story had a somewhat happy ending. He played throughout the season with a long list of ailments, but never once gave into attacking the referees or others for his shortcomings. He became the Most Valuable Player of the league, and led his team to the championship series. Though his team did not win, the team did make it to a place no one ever thought they could reach.

I submit this was all possible because he decided to focus on how he could be a better teammate to his team, and thus the rest is history. A small thing such as a change in focus or attitude can pay large dividends when you are willing to go the distance to make it work.

"You begin to see obstacles when you lose sight of your goals."

—Author Unknown

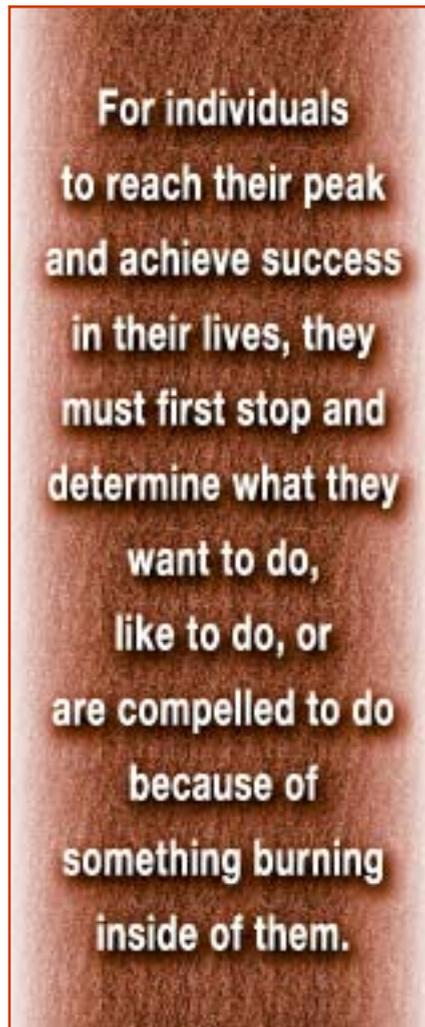
Step 2

Second, I continued to validate the attributes list by interviewing a couple of successful program managers on campus. Also, I took note of the presentation that Air Force Acquisition Center of Excellence Director Terry Little gave when he visited DAU as a guest lecturer.

The one key item uncovered in these encounters was *commitment*. This was a continuing theme throughout the discussions: *in order for PMs to perform at a high level, they must first know and understand what the mission is, and then "buy in" to the mission*. Without commitment, all you have are folks gathered together spinning their wheels and getting paid. If success occurs along the way, it is probably happenstance, and thus, cannot be replicated again.

Step 3

In Step 3, I reviewed literature from DAU's Acker Library to gain an additional data point that validated the attributes of the most successful program managers. One author of particular note was John C. Maxwell whose book, *Success Journey*, was quite interesting and informative, with a wealth of good information about how individuals can reach their peak and achieve success in their lives.



However, to reach their peak, they must first stop and determine what they want to do, like to do, or are compelled to do because of something burning inside of them. Once they decide what their mission in life is, to see it through to fruition they must commit themselves—as individuals—to that mission.

"Great spirits have always encountered violent opposition from mediocre minds."

—Albert Einstein

Maxwell also discussed one particularly relevant acronym—**ROADMAP**.

- **R** stands for the need that we have to recognize our dream (mission) in life.
- **O** stands for observing our starting point; you need to know where you are currently in order to better understand how to get to your dream.
- **A** is for articulating a statement of purpose for your dream—how you are

going to realize it and make it come true.

- **D** is for defining the goals necessary to reach your dream and determining intermediate milestones to help keep you on track.
- **M** is for moving into action. For each 100 people that say they plan to do something, 67 will actually move beyond the talk stage, with 10 actually developing a detailed plan; however, only two will actually move out and execute the plan.
- **A** is for adjusting your plan based on new information or other changes that occur.
- **P** is for pointing to successes and celebrating at each of your interim milestones in order to keep "pumped up" and make it to the ultimate dream.

"It's what's learned and used, not what's taught that counts!"

—Unknown

Step 4

Step 4 is reviewing my PROFILOR results to determine what my strengths and weaknesses actually are. The DPMRS lists eight different attributes of the best PMs. Based on my PROFILOR results, I currently exhibit all eight of the attributes; however, the first five were more prevalent than the others. Obviously, the latter three attributes were the ones that I exhibited less.

"It's what you learn after you know it all that's important."

—John Wooden

Step 5

In Step 5, the strengths that I chose to emphasize more were Drive for Results, Motivate Others, and Provide Direction. The weaknesses that I chose to address were Coach and Develop, Champion Change, and Establish Plans.

Step 6

The last and final step—publication of this article.

Editor's Note: The author welcomes questions or comments on this article. Contact him at Keith.Lymore@pentagon.af.mil.



Business Initiative Council Approves Fourth Round of Initiatives

The Department of Defense announced today that the Business Initiative Council (BIC) has approved four more initiatives, bringing the total of approved initiatives to 32, since its first meeting in September 2001. These latest initiatives are designed to enhance the processes for corporate operations, logistics and readiness, and acquisition management.

First, within the corporate operations arena, the Department is reviewing the policies governing cell phone reimbursement in order to provide a flat payment for official use of employees' personal cell phones. This will greatly simplify accounting and oversight requirements.

In a second initiative, the Department plans to streamline mandated requirements for independent readiness assessments of critical technologies and allow program managers and the science and technology executives of each Service component to jointly decide if assessments are warranted.

The Department's third initiative will identify non-value added, recurring reporting requirements, which can be eliminated. The fourth initiative seeks to streamline the information technology equipment disposal process, by clarifying business rules and eliminating duplication.

The council, established in June 2001 and presided over by Under Secretary of Defense for Acquisition, Technology and Logistics Pete Aldridge, was originally comprised of the military Service secretaries and the Vice Chairman of the Joint Chiefs of Staff. The Senior Executive Council (SEC), chaired by the Secretary of Defense, recently approved the expansion

of the BIC membership to include the Under Secretary of Defense, Comptroller and Chief Financial Officer, and the Under Secretary of Defense for Personnel and Readiness.

Another change is the transfer of lead-Service duties from the Air Force to the Army, effective April 1, 2002. The unique operating philosophy of the BIC has been to rotate lead duties among the Services. After the Navy shepherded the program through Phase I, the Air Force assumed the lead role in October 2001.

"The Air Force has done a phenomenal job in leading the BIC effort through Phase II, and in gaining consensus among the team players," said Aldridge. "They will turn over a top-notch leadership effort to the Army."

The BIC began its efforts to improve business operations by identifying and implementing business reforms, which would allow each Service to reallocate savings to higher priorities.

"We continue to be impressed by the depth and breadth of the initiatives which the BIC is examining," said Aldridge. "In fact, all of the Services, the Office of the Secretary of Defense, and the Joint Staff have tasked their subordinate units to send us more initiatives. So the initiatives are coming in from all levels of the Department, from the grass roots to the highest levels, which explains the diversity of the initiatives we are reviewing."

Editor's Note: This information is in the public domain at <http://www.defenselink.mil/news>.

Risky Business

7 Myths about Software Engineering That Impact Defense Acquisitions

DR. BARRY BOEHM • LT. GEN PETER KIND, USA (RET.) •
DR. RICHARD TURNER

“About the only thing you can do with an F-22 without software is to take a picture of it.”

—Unidentified Air Force General

Without knowing it, many DoD project managers make significant programmatic and technical decisions based on misunderstanding software technology and systems engineering activities. While many of these decisions don't seem software-related, they often cause software-induced project overruns and negative impacts on downstream effectiveness, system enhancement and supportability—and program managers' career paths.

DoD PMs are not alone in this difficulty. The figures from the 1999 Standish Group's survey show only a 26 percent overall success rate for software-intensive systems, with only 18 percent of government projects succeeding, and zero percent of any projects over \$10 million. Historically, a typical software-intensive project overruns its budget and schedule by a factor of 2 and delivers about 60 percent of the required functionality.

In this article we present 7 myths that were identified by a defense software engineering science and technology

summit convened by the Deputy Under Secretary of Defense for Science and Technology in August 2001—all of which have contributed to poor acquisition decisions and to the resulting overruns and poor performance.

Software is the Key

Why do PMs need to be concerned about how programmatic decisions impact software? Because, software crisis or not, software plays an increasingly critical role in defense systems. While hardware and weapons platforms will remain relatively stable, functionality and adaptability will be added through improved resident software or access to additional capabilities through software-enabled, network-centric applications.

Defense systems are increasingly performing critical functions autonomously via software. Functions like target and weapon acquisition, selection and firing, terrain following, re-supply, sensor data prioritization, and health checking and healing of network-centered infrastructure and components are currently in limited operation and will continue to propagate through more and more systems. Future systems require real-time coordination of the software operating in a variety of platforms, weapons, and sensors; and the complexity of the systems and software will increase significantly to perform these functions.



Boehm is currently the Director of the University of Southern California (USC) Center for Software Engineering. At the Defense Advanced Research Projects Agency (DARPA), he managed 20 program managers and over \$1 billion in acquisitions. He has over 30 years' experience as a DoD contractor. A retired Army lieutenant general, Kind is currently a Research Staff Member with the Institute for Defense Analyses. He has extensive IT, PEO, and operational experience in the Army and the private sector. He created and managed the White House Information Coordination Center for the Y2K Rollover within cost, performance, and schedule. Turner is the Assistant Deputy Director for Software Engineering and Acquisition in the Software Intensive Systems Office, OUSD(AT&L), and a Research Professor at The George Washington University. He co-authored the book CMMI Distilled (Addison-Wesley).

A History of Non-Fixes

Numerous reviews and reports have been published to address the software problem. The *2000 Defense Science Board Task Force Report on Defense Software* cited 20 years of studies and recommendations. Unfortunately, of the 134 unique recommendations—all of which were judged still applicable—only 3 have been implemented, and only 18 are included in policy.

myths that contribute to the current state of software acquisition.

Myth No. 1:

COTS [Commercial Off-the-Shelf] and commercial practices are the answer.

Fact:

COTS works well in some situations but greatly increases risk in others. Commercial practices are optimized around rapidly bringing products to market, but with lower-

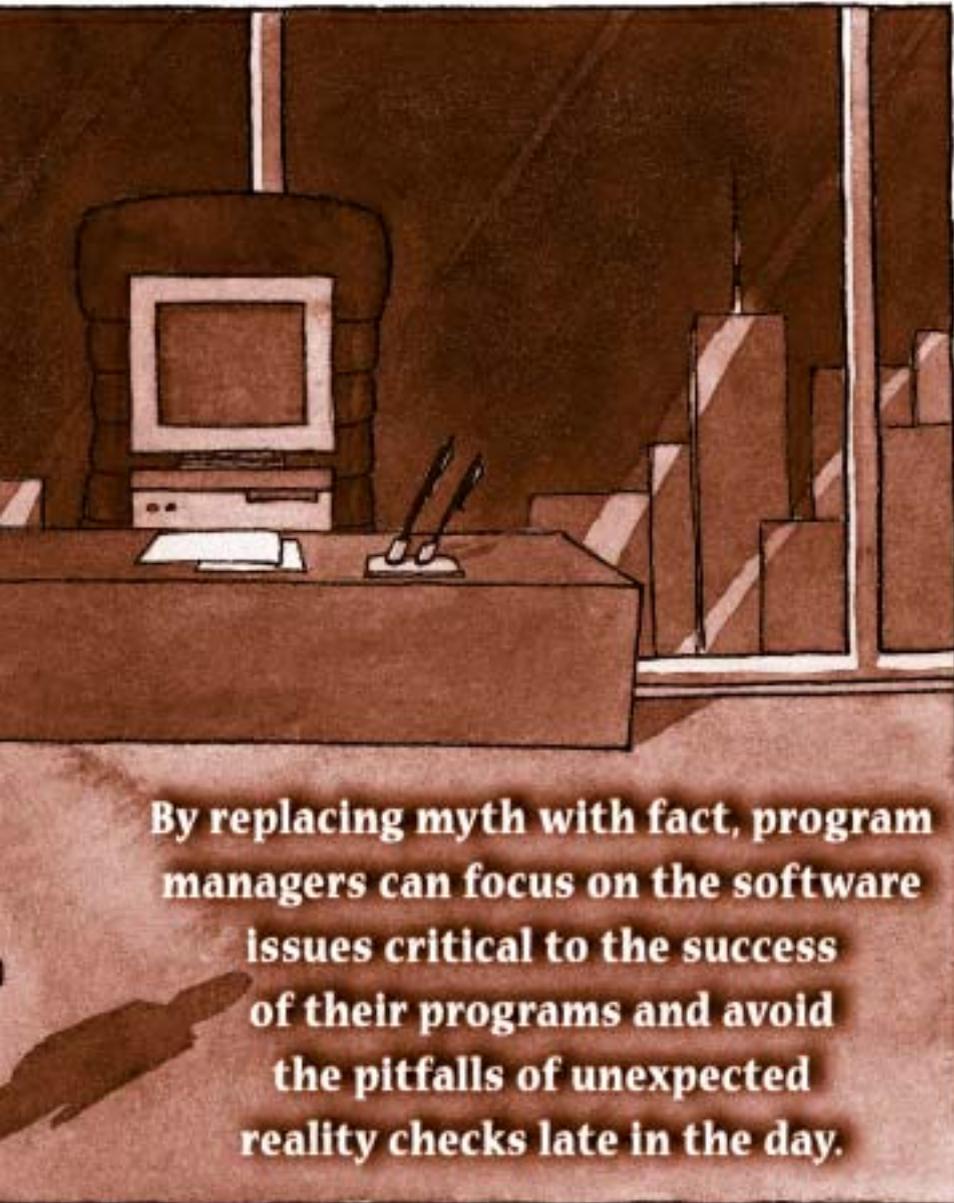
way in which DoD would solve its software problems and vault into the 21st century as a lean, mean, acquiring machine. While the use of COTS in information processing has been reasonably successful in many cases, those in charge of developing software-intensive systems designed for unique DoD missions have frequently found COTS more a burden than a benefit.

Real problems may emerge when integrating COTS into a system with the typical DoD life span. The short COTS software release rate and ongoing platform evolution make it extremely difficult to merge with the long development and sustainment programs common in today's systems. (For example, the Cheyenne Mountain air defense software system was first developed in the 1950's and continues today.)

When verifying system quality, safety and security, the proprietary "black box" nature of COTS can force unrealistic requirements on other components, raising cost and delaying programs. Interoperability can be difficult to achieve with COTS software that adds or changes features rapidly with little attention to backward compatibility.

With COTS the PM gives up control over program functionality and schedule, and incurs integration and testing costs with attendant schedule delays. Functionality may change based on needs of marketing and the principal customer base, adversely affecting the design and operation of the DoD application.

Security, safety, and quality of COTS are largely unknown; software may contain Trojan horse code or exploitable weaknesses. Current tools are inadequate to discover and assess these faults, and corrections are only done by vendors according to their schedules—if corrected at all. Finally, defense systems are larger and more complex. Integration is problematical under the best of conditions; scalability is exacerbated with components not designed for a given architecture, interfaces, and terminology.



By replacing myth with fact, program managers can focus on the software issues critical to the success of their programs and avoid the pitfalls of unexpected reality checks late in the day.

Why haven't these recommendations been implemented? Our experience indicates that believing in myths is easier than dealing with the thorny underlying issues. Let's look at 7 widely believed

quality attribute levels than DoD mission-critical systems require.

For the last dozen years the common wisdom has been that COTS was the

7 Myths About Software Engineering That Impact Defense Acquisition

Myth No. 1:

COTS and commercial practices are the answer.

Fact:

COTS works well in some situations but greatly increases risk in others. Commercial practices are optimized around rapidly bringing products to market, but with lower-quality attribute levels than DoD mission-critical systems require.

Myth No. 2:

Commercial industry will do DoD's needed software research.

Fact:

Commercial industry does mass marketplace research.

Myth No. 3:

The problem is software and programming methodology.

Fact:

The problem is integrating software and system concerns.

Myth No. 4:

Software Engineering Institute Capability Maturity Model (SEI CMM)

for Software (or Capability Maturity Model Integration—CMMI) is the answer.

Fact:

Process maturity is only one aspect of software engineering.

Myth No. 5:

Evolutionary Acquisition is the answer.

Fact:

Evolutionary acquisition is a work in progress.

Myth No. 6:

It's software—we can fix it later (add security, quality, other "-ilities").

Fact:

Most "-ilities" must be architected in, and can't be easily added later.

Myth No. 7:

Create great components and the software engineering will take care of itself.

Fact:

That's DoD's current course, and the problems aren't going away.

engineering research and development has been strong and clear. Unfortunately, DoD has specific needs that don't match well with industry's goals. Technology companies don't have the resources, need, desire, or profit motive to address the extra-hard problems—problems such as ultra-reliable agent-based systems, and achieving interoperability and process coordination across dozens of simultaneously evolving systems-of-systems.

An example of a system dependent on this type of technology is the Army's Future Combat System. The Army envisions a distributed, embedded, high-assurance, agent-based system of systems that will provide warfighters a real-time common operating picture so effective that the protection from its superior information capabilities will replace 20 tons of armor. Some of the supporting technology research is being sponsored by the Defense Advanced Research Projects Agency (DARPA). However, as members of the President's Information Technology Advisory Committee (PITAC), two major commercial technology leaders agreed that neither of their companies had the motivation to address this kind of problem.

There are several ways to counter this myth and its effects on defense systems. Program managers should assess the degree to which commercial products and research priorities are the same as their programs and leverage any commonality. On a larger scale, DoD needs to increase its emphasis on sponsored software engineering science and technology and better utilize its existing assets through improved research coordination.

DoD funds a significant amount of hardware manufacturing technology research—making a similar investment in software engineering (the software equivalent to manufacturing) and research would appear beneficial. DoD can also partner with industry to address specific needs and increase defense representation in standards development bodies and leading-edge technology venues.

"Anything sufficiently complex is to the layman indistinguishable from magic."

—Arthur C. Clarke

The COTS myth, while pervasive, can be countered in several ways. First, program managers should invest in thorough risk-driven COTS assessments before committing to use commercial products. DoD should establish more flexible COTS policies that recognize defense system realities and not force program managers into a risky, limited technology trade space.

DoD should also work closely with COTS vendors to influence product stability, feature sets, and verifiable qual-

ity. Finally, establishing COTS test beds and technology watch initiatives, coupled with strong configuration management, can support broader COTS validation and interoperability investigations.

Myth No. 2:

Commercial industry will do DoD's needed software research.

Fact:

Commercial industry does mass marketplace research.

From the halls of Congress to the halls of the Pentagon and the ears of the program managers, the direction to depend on commercial vendors for software en-

Myth No. 3:

The problem is software and programming methodology.

Fact:

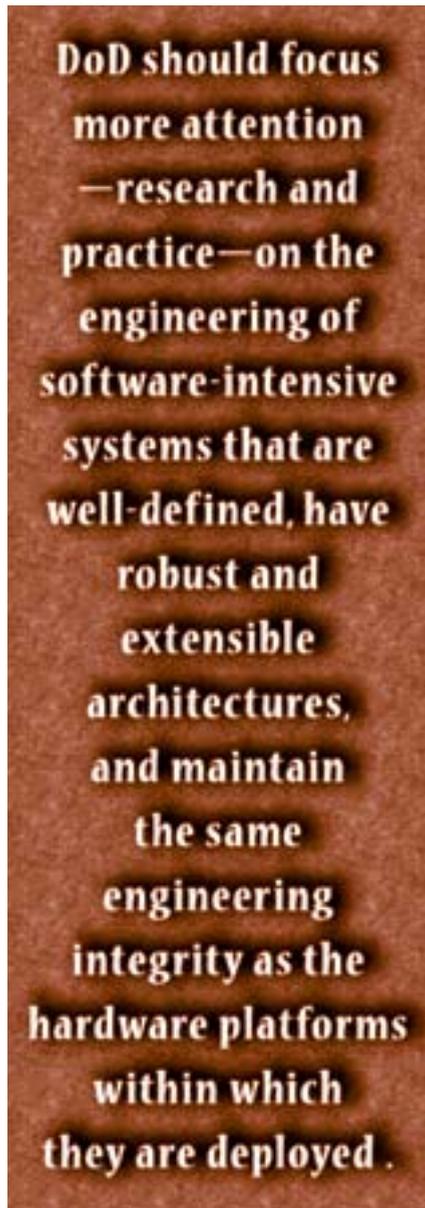
The problem is integrating software and system concerns.

Software has been widely blamed for program cost and schedule overruns and for systems that fail to meet their specifications. However, software is not always the real culprit. In some cases, poor acquisition decisions and systems engineering cause problems that inevitably manifest in the software. In others, software requirements are belatedly defined because software ends up as the catchall for things not done in other components.

These late software bail-outs often put high-risk software on a program's critical path. The OSD Tri-service Assessment Initiative has performed systemic analysis on three years of independent expert reviews of software-intensive system programs. This analysis confirms that although failures may be highlighted in software, actual causes stem from many different programmatic and technical factors. Understanding the relationship of software to these factors before taking any corrective action is essential.

Countering this myth calls for a broader approach to improving software acquisitions. Programs should focus on early validation of software/system solution feasibility, using spiral-oriented criteria found in Life Cycle Objective and Life Cycle Architecture milestones. Software engineering research can help identify ways to support better decision making on software and systems engineering issues.

DoD should develop coherent policy for software and systems engineering that acknowledges the challenges and works rationally to achieve more realistic expectations, schedules, and development environments. DoD should make quality software development personnel and environments more important than least cost in software acquisition—it will be far cheaper in the long run.



Myth No. 4:

Software Engineering Institute Capability Maturity Model (SEI CMM) for Software (or CMMI-Capability Maturity Model Integration) is the answer.

Fact:

Process maturity is only one aspect of software engineering

Arguably the greatest impact on software engineering in the past decade has been the Software Engineering Institute's Capability Maturity Model for Software. It brings a focus on discipline and process improvement to an industry that still reels from seemingly ever increasing expectations. The latest generation of SEI tools, Capability Maturity Model Integration, extends the CMMI to other

disciplines, including systems engineering. However, as with any tool, CMM can't be everything in every context. Having mature processes doesn't guarantee that the requirements, architectures, and other system aspects such as information security are adequate.

Process maturity does not guarantee community-wide innovative solutions or resolve complex teaming and subcontractor relationships among high- and low-maturity organizations. It can't address the technical challenges of the software-intensive systems under development, make up for poor acquisition decisions, or work effectively with low-maturity acquisition organizations. Process maturity is a necessary but not sufficient condition to guarantee quality, cost effectiveness, and technological innovation.

Overcoming this myth requires leveraging the strengths of process maturity without abdicating responsibility because a contractor is CMM Level 3 or better. PMs need to be in charge. DoD should continue to support developer and maintainer process improvement as part of an overall software and systems engineering quality and cost-effectiveness initiative.

Process improvement strategies should also be implemented within the acquisition organizations so as to maximize the benefits to the government of high-maturity contractors. PMs need to balance process initiatives with people, product, product line, and technology initiatives that focus attention on systemic issues rather than focus on process alone.

Myth No. 5:

Evolutionary Acquisition (EA) is the answer.

Fact:

Evolutionary Acquisition is a work in progress.

Evolutionary Acquisition is seen as a way to improve some of the system acquisition problems related to software, particularly where requirements are either unknown or evolving. Based on the

Software Acquisition Resources for PMs

- Air Force Software Technology Support Center (www.stsc.hill.af.mil)
- Center for Software Engineering at USC (sunset.usc.edu)
- Defense Acquisition University (www.dau.mil)
- Institute for Defense Analyses (www.ida.org)
- International Council on Systems Engineering (INCOSE) (www.incose.org)
- OUSD Software Intensive Systems, Defense Software Collaborators, and Tri-service Assessment Initiative (www.acq.osd.mil/ara/sis).
- Software Engineering Institute of Carnegie Mellon University (www.sei.cmu.edu)

concept of the spiral software development life cycle, EA is ideally a risk-driven approach that adjusts requirements and priorities based on usage experience. The myth lies in assuming widespread ability to actually execute such a program. Although EA has worked very well with knowledgeable acquirer-developer teams, many PMs don't have access to the essential knowledge, skills, or tools to manage EA. For the complex acquisitions currently envisioned (e.g., rapidly evolving, COTS-intensive systems of systems), current tools are simply not up to the task.

In some cases, the underlying science for basic management activities is not completely understood. Further complicating EA implementation is the difficulty in establishing contracts that meet DoD regulations and still provide for an evolutionary approach.

Countering the effects of this myth means making sure that EA is appropriate for your program, and if it is, investing the necessary effort up front to ensure the necessary expertise and infrastructure is available. Guarding against spiral development/EA pitfalls is important. For example, certain aspects of a true spiral process are required for it to be effective, but often PMs are led into implementing hazardous spiral look-alikes that don't provide these key components.

Software engineering science and technology can help build the theoretical and practical foundations for successful Evolutionary Acquisition. Most importantly, contracting must be modified to lend stronger support to non-waterfall software acquisitions.

Myth No. 6:

It's software—we can fix it later (add security, quality, other “-ilities”).

Fact:

Most “-ilities” must be architected in, and can't be easily added later.

One of the most widely held myths about software is the idea that incomplete or prototype software can be “hardened” for use in operational environments. In reality, this is almost always impossible and leads to missed schedules or worse. The software and system architecture must be designed from the beginning to accommodate stringent security, reliability, fault tolerance, and other operational requirements. As early as 1975, Fred Brooks, a noted Professor of Computer Science at Chapel Hill, documented a factor-of-9 increase in effort to go from a running computer program to a software system product.

Even further, re-designing significant amounts of software that have already been implemented is simply too complex and intricate a task. The result is that the developers have to go back to

square one and essentially rebuild the system based on a more appropriate architecture.

This myth of infinitely malleable software can be countered by focusing on early validation of software/system solution feasibility and providing adequate funding in the architectural development stages of a system. One rule of thumb to follow: *Never deploy prototypes that haven't been based on a planned, architecturally based evolutionary program.*

If deployment or reuse of prototype software is a possibility, insist on more rigorous design and coding standards in prototyping environments. The implementation of product lines that leverage good architectures can greatly reduce the cost of the “-ility” requirements in similar systems.

Myth No. 7:

Create great components and the software engineering will take care of itself.

Fact:

That's DoD's current course, and the problems aren't going away.

The National Science Foundation sponsored a workshop on software engineering in 1999 that identified quality components (networks, databases, user interface packages, agents, filters, etc.) as only one aspect of successful systems. Of as much importance were the software process, development and support environment, architecture, and tools.

Countering this myth includes making sure the component innovators know how to develop robust software, perhaps through process maturity assessments. Carefully assess the technology readiness of hot new software components before depending on them for system success. Wherever possible, use open systems and other standards that support component integration. Most importantly, DoD should focus more attention—research and practice—on the engineering of software-intensive systems that are well-defined, have robust and extensible architectures, and maintain the same engineering integrity as

the hardware platforms within which they are deployed.

“The world will never need more than five computers.”

—T. J. Watson
(First President of IBM)

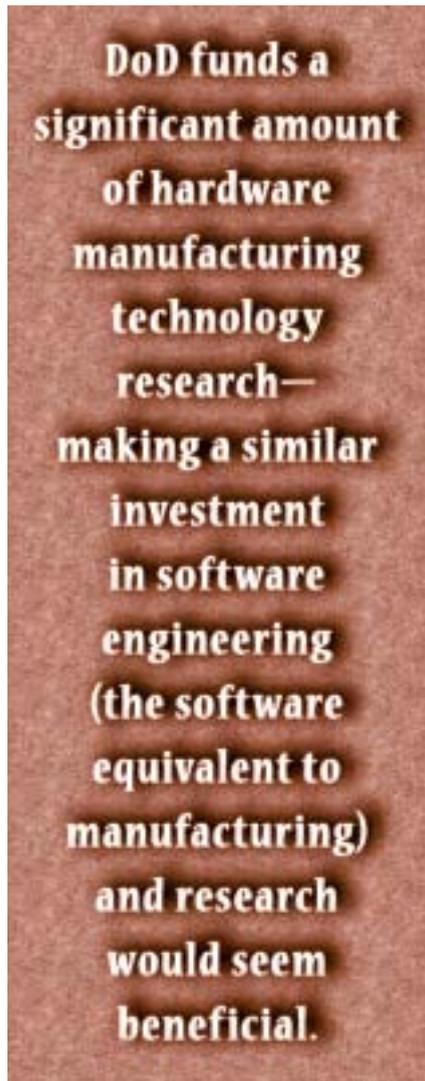
Programs That Beat the Myths

Programs do exist that have beaten the myths and can be used as role models for successfully achieving complex software goals. The January 2002 issue of *CrossTalk: The Journal of Defense Software Engineering* announced the Top 5 Government Quality Software Projects for 2001. In addition to the *CrossTalk* award winners, other examples of myth-beating programs include:

- The Command Center Processing and Display System—Replacement for the Air Force used several innovative techniques and is presented as a case study in Walker Royce’s *Software Project Management*.
- The Army’s Advanced Field Artillery Tactical Data System now interoperates with the Joint Surveillance Target Attack Radar System and unmanned aerial vehicles and is acclaimed in the September-October 2001 *Field Artillery Journal*.
- The Navy’s AEGIS program has successfully evolved across several generations of computer and software technology for over 20 years.

So What Now?

As Fred Brooks said in 1986, there are no silver bullets. And, truthfully, there are far too few lead bullets that will work as well for tomorrow’s software projects as well as they do today. But by replacing myth with fact, program managers can focus on the software issues critical to the success of their programs and avoid the pitfalls of unexpected reality checks late in the day. PMs need to understand the decisions that affect software aren’t necessarily identified as software decisions. Any decision that impacts systems engineering, requirements, technology insertion, or similar concerns is highly likely to impact software.



“It is not necessary to change. Survival is not mandatory.”

—W. Edwards Deming

Summarizing the recommendations in countering the myths, program managers should:

- Invest in thorough risk-driven COTS assessments before commitment.
- Make sure that commercial vendor priorities are consistent with program needs.
- Focus on early validation of software/system solutions through architectural reviews.
- Use process maturity as an indicator, not a guarantee.
- Make sure your program has access to sufficient expertise to implement the Evolutionary Acquisition model, and to use risk-driven spiral processes.

- Focus on a quality system/software architecture and consider software product line approaches where feasible.
- Use open systems where possible and make sure any software components are appropriate and mature.

Just as critical are actions on the part of the defense acquisition community. DoD should require broader software education for key program personnel. More software engineering science and technology funding can produce development and acquisition technology that could make the right way to acquire software-intensive systems the easy way. DoD is moving to implement the remaining Defense Science Board recommendations, but progress is slow and hampered by existing policy and infrastructure. Most critical is the need to bring acquisition policy into line with weapons systems’ software needs so that programs can implement approaches like Evolutionary Acquisition without running afoul of constraining rules and contracting practices.

Software is moving from the world of myths to the world of facts. An increasingly critical success factor for PMs will be their ability to distinguish software myths from software facts, either through experience, education, or acquiring appropriate experts.

Although DoD currently has few in-house experts in Evolutionary Acquisition of software-intensive systems, PMs can employ several external talent sources. Above all, if you’re short on such talent, fill the need expeditiously. When you do, be sure to talk to those resources regularly. Don’t bet your project or career on traditional sequential processes, COTS promises, or believing the 7 myths. That’s the easiest way to end up as the next Standish survey statistic.

Editor’s Note: The authors welcome questions or comments on this article. Contact **Boehm** at boehm@sunset.usc.edu; **Kind** at pkind@ida.org; and **Turner** at Rich.Turner@osd.mil.

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**ANNOUNCING
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Mentor-Protege Conference Setting for 2002 Nunn-Perry Awards

Extending a Helping Hand

CHRISTINA CAVOLI

Recognizing the best of the big guy-little guy relationships fostered by the Mentor-Protégé program, the 2002 Nunn-Perry awards selected 12 partnerships for commendation on March 20, during this year's Mentor-Protégé conference. Named for Sam Nunn, the former senator who initiated the program in 1990, and William Perry, former Secretary of Defense who helped launch the program, the awards laud the success stories resulting from partnering a big business with a smaller one to create a mutually beneficial relationship that brings quality and economy to government contracts.

The Nunn-Perry awards serve as the highlight of the Mentor-Protégé Conference, an annual event that brings together all participants in the process with representatives from the Department of Defense for seminars, presentations, and discussion. The program is designed to provide incentives for major DoD prime contractors, "Mentors," to help "Protégés": small disadvantaged businesses (SDBs), women-owned businesses, and qualified organizations that employ the severely disabled.

With the Mentors' technical and business expertise, Protégés hope to successfully compete for prime contract and subcontract awards. Successful Mentor-Protégé partnerships create a winning relationship for both the companies and the DoD.

Presenting the awards this year at a ceremony held in Crystal City, Va., were Michael W. Wynne, Principal Deputy Under Secretary of Defense for Acquisition, Technology and Logistics, and Frank Ramos, Director, Office of Small & Disadvantaged Business Utilization.

In his keynote speech, Wynne recognized the courage and initiative necessary to start a small business, and the need for established, larger companies to extend a helping hand to new companies in the hopes of creating a mutually beneficial and rewarding relationship. To learn more about the Mentor-Protégé Program, visit their Web site (www.acq.osd.mil/sadbu/mentor_protégé).



George Schultz, DoD Mentor-Protégé Program Manager, and Frank Ramos, Director, Office of Small & Disadvantaged Business Utilization, explain the Nunn-Perry Awards Program.



Michael W. Wynne, Principal Deputy Under Secretary of Defense for Acquisition, Technology and Logistics, and Frank Ramos, Director, Office of Small & Disadvantaged Business Utilization, present the Nunn-Perry Awards at the DoD Mentor-Protégé Conference March 20 in Crystal City, Va.

2002 NUNN - P

Principal Deputy USD(AT&L) Jo 12 Exceptional Me

AMEC Earth Environmental—Bering Sea Eccotech

Protégé: William Arterburn, Bering Sea Eccotech, Anchorage, Alaska;

Mentor: Michael Brainard, AMEX Earth Environmental, Chantilly, Va.;



Battelle Memorial Institute—MTS Technologies

Mentor: Robert Acker, Battelle Memorial Institute, Arlington, Va.; **Pro-**

tégé: Daniel Perkins, MTS Technologies, Arlington, Va.; Principal Deputy USD(AT&L) Michael W. Wynne; and Frank Ramos, Director, Office of Small & Disadvantaged Business Utilization.



Bell Helicopter Textron—Valco Manufacturing

Mentor: Don Collings, Bell Helicopter Textron, Hurst, Texas.; **Protégé:** Roger Valdez, Valco Manufacturing Corp., Duncan, Okla.; and Wynne.



Computer Sciences Corp.—3D Research

Protégé: Lisa Williams, 3D Research Corp., Huntsville, Ala.; **Mentor:** Terry Glasgow, Computer Sciences Corp., Falls Church, Va.; Wynne; and Ramos.



Foster Wheeler Environmental—Nobis Engineering

Protégé: Nannu Nobis, Nobis Engineering Inc., Concord, N.H.; **Mentor:** Gene Blake, Foster Wheeler Environmental, Langhorne, Pa.; Wynne; and Ramos.



HJ Ford Associates—HMR TECH

Mentor: Patrick Shannon, HJ Ford Associates Inc., Arlington, Va.; **Pro-**
tégé: Hezekiah Richardson, HMR TECH, LLC, Arlington, Va.; Wynne; and Ramos.



ERRY AWARDS

ins SADBUDirector in Honoring ntor-Protégé Teams

HydroGeoLogic, Inc.—MicroPact Engineering, Inc.
Ramos; **Mentor:** Kris Collo, HydroGeoLogic, Inc., Herndon, Va. Not
shown in photo is **Protégé:** Micropact Engineering, Inc., Herndon, Va.



Raytheon—Basic Electronics
Ramos; **Protégé:** Nancy Balzano, Basic Electronics, Garden Grove,
Calif.; **Mentor:** Jim Boyle and Dan Ryan, Raytheon Naval & Maritime In-
tegrated Systems, Portsmouth, R.I.; and Wynne.



Roy F. Weston—Charter Environmental
Ramos; **Mentor:** Bruce Campbell, Roy F. Weston, Manchester, N.H.;
Protégé: Robert Delhome, Charter Environmental Inc., Chelsea, Mass.;
and Wynne.



TRW Space & Electronics—Coast/ACM
Protégé: Benjamin Nguyen, Coast/ACM, Los Angeles, Calif.; **Mentor:** Al
Boldon, TRW Space & Electronics, Redondo Beach, Calif.; Wynne; and
Ramos.



SAIC—Noesis
Ramos; **Mentor:** Richard Eger, Science Applications International Corp.,
San Diego, Calif.; **Protégé:** Richard Martin, Noesis Inc., Manassas, Va.;
and Wynne.



TRW Space & Electronics—Hurlen
Ramos; **Protégé:** Jay Hurtado and Henry Pena Hurlen Corp., Santa Fe
Springs, Calif.; **Mentor:** Al Boldon, TRW Space & Electronics, Redondo
Beach, Calif.; and Wynne.





Advanced Concept Technology Demonstration List for 2002 Announced

Edward C. "Pete" Aldridge, Under Secretary of Defense for Acquisition, Technology and Logistics, announced today the selection of new Advanced Concept Technology Demonstration (ACTD) projects for fiscal year 2002. The ACTD program aids in rapidly transitioning advanced technology into the hands of the unified commanders. Of the funded ACTDs for fiscal year 2002, 11 will directly support the war on terrorism.

The military services, theater commanders, and Defense agencies submitted nearly 80 proposed fiscal year 2002 ACTD projects. Representatives of the military services and unified commanders reviewed the list of proposals and provided their priorities to the Joint Staff's Joint Requirements Oversight Council (JROC). Marrying new operational concepts with new technologies, ACTDs reduce the time required to field new systems and increase end-user involvement in system refinement and integration.

Initiated in 1995, the ACTD program focuses on rapidly placing maturing technologies in the hands of warfighters. In partnership with operational commanders, the Services and the Joint Staff, the program delivers prototypes as tailored solutions for validated mission needs. Our products demonstrate the military utility of new technologies while giving warfighters hands-on experience to develop concepts for operational employment.

ACTD projects span a broad spectrum of operational requirements with an empha-

sis on joint capabilities. In many cases, ACTDs yield transformational changes. Products such as unmanned aerial vehicles (UAVs) and unattended ground sensors (UGS) change the paradigms for military operations. Approximately 30 ACTD products support our nation's counter-terrorism efforts in Operation Enduring Freedom and Operation Noble Eagle.

The ACTDs selected for initiation in fiscal year 2002 include:

Active Denial System: A system mounted on stationary and mobile platforms to provide long-range, anti-personnel, non-lethal force options to commanders.

Agile Transportation: A system providing visibility of transportation requirements and assets to improve scheduling decision support tools for mode determination and optimization of inter- and intra-theater lift assets.

Coalition Information Assurance Common Operational Picture: Provides a detailed information assurance and situational awareness picture of the information system security status of all mission-critical systems on a near- or-real-time basis in support of CINC and coalition missions.

Contamination Avoidance at Seaports of Debarkation: Provides a deployable package for a chemical and biological defense capability at seaports of debarkation to minimize impact on seaport operations.

Expendable Unmanned Air Vehicle and Air-Launched Extended Range Transporter: Air vehicles providing covert delivery of off-board sensors, tactical surveillance, battle damage assessment, and weapons of mass destruction monitoring at low cost.

Homeland Security: A homeland security capability for assured, secure, survivable interagency network connectivity to assess and track threats across multiple domains with a coordinated response capability to neutralize threats and recover from damage.

HYCAS: A hyperspectral collection and analysis system with sensors integrated onto operational platforms and into the existing tasking, processing, exploitation and dissemination (TPED) architectures supporting a counter-concealment, camouflage, and deception intelligence capability.

Joint Explosive Ordnance Disposal-Knowledge and Technology Operational Demonstration: A system providing a new integrated capability for joint and coalition explosive ordnance disposal forces.

Language and Speech Exploitation Resources: Systems automating translation of spoken or written foreign languages for quickly translating captured documents, debriefing witnesses, and supporting communication in coalition operations.

Micro Air Vehicle: A fully autonomous 6- to 9-inch micro aerial vehicle providing small ground combat units with situational awareness of enemy activity using a low-cost, disposal air vehicle.

Pathfinder: An integration of unattended ground vehicles, unmanned air vehicles, and smart sensors in a mobile, self-forming network providing enhanced situational awareness, command, control and communications to commanders and assault forces for urban reconnaissance.

Thermobaric: A penetrator payload to defeat enemy tunnel facilities and weapons.

Three additional ACTD projects will be initiated during this fiscal year if funding permits. These include:

Agent Defeat Warhead: A weapon providing a high-temperature incendiary kinetic energy penetrator warhead to destroy biological and chemical manufacturing and storage facilities.

Joint Distance Support and Response: A system providing near-real-time, reliable, accurate telemaintenance for forward deployed forces and weapon systems using a collaborative knowledge center and tool suite, with reach-back capability.

SPARTAN: An unmanned surface watercraft providing a low-cost force multiplier with integrated expeditionary sensor and weapon systems for use against asymmetric threats.

Editor's Note: This information is in the public domain at <http://www.defenselink.mil/news>. Information on ACTDs can be found at <http://www.acq.osd.mil/actd/descript.htm>.

Innovation Through "Venture Capital" in DoD's Working Capital Fund (WCF) Organizations

Generating New Ideas and Turning Ideas Into Revenue

MARK LEWIS

"...The last bastion of Soviet-style central planning can be found in Fortune 500 companies—it's called resource allocation."

—Gary Hamel
Bringing Silicon Valley Inside

Of the largest 100 firms in the United States a century ago, only a handful exist today in any form. Various fates awaited them on the road to oblivion—mostly bankruptcies and takeovers. Given enough time, successful firms will usually fail because they become irrelevant, their products and services surpassed by far better offerings. They move too slowly to keep up with the market.

The Need for Innovation

Peter Drucker, in his article "The Discipline of Innovation," published by *Harvard Business Review* in 1998, defines *innovation* as "the effort to create purposeful, focused change in an enterprise's economic or social potential." The history of American business makes it clear that sustained innovation is a prerequisite for an organization's long-term success and its continued existence.

Lewis is currently an engineer participating in the Commander's Development Program at Naval Sea Systems Command (NAVSEA), at the Washington Navy Yard. He holds a master's degree in Business Administration and graduated from Harvard Business School's "Program for Management Development." He is also a graduate of the Advanced Program Management Course (APMC 01-2), Defense Systems Management College, Fort Belvoir, Va.

The venture capital program should provide ideas an easy stroll to acceptance, vs. the uphill struggle and war of attrition they now face.



Within the private sector, the language of business is peppered with terminology such as merger, acquisition, and bankruptcy. Within the Federal Government, the counterparts to those terms are reorganization, RIF [Reduction in Force], and BRAC [Base Realignment and Closure}. As in industry, government organizations close shop when there is no demand for their output; it happens at a slower and less dramatic pace than in the private sector, but it happens nonetheless.

Generating new ideas and turning the ideas into revenue is a primary characteristic of firms that stay healthy over decades. The quick pace of technology continues to shorten product life cycles, so faster innovation cycles become increasingly important. A good product pipeline is essential, and companies like Kodak, Digital Equipment, and General Instruments that fail to sustain innovation show the way to insolvency. But do government Working Capital Fund (WCF) monopolies (for example, the Naval Undersea Warfare Center, the Defense Logistics Agency, and the Air Force Transportation Command) face similar risks of irrelevance? Certainly!

In some of our organizations, more than half of the 1990 workforce is now gone. The trend is outsourcing, where industry designs and develops almost all military platforms and systems, industry funds and conducts a higher percentage of research, and full-service contracting will dramatically reduce the need for government logistics and maintenance personnel. Contractors, not government technical experts, will accompany the warfighters into harm's way. The handwriting is on the wall for many WCF business units, largely because of our inability to innovate and keep up with the private sector.

(The DoD's WCF organizations operate much like private firms, except that turning a profit is not allowed. Through marketing and sales of services, we generate revenues, which in turn pay salaries and other expenses. If revenues drop, expenses must drop by the same amount. This is in contrast to head-

quarters, program offices, etc., that are "mission funded" directly in the defense budget.)

The illustration on p. __ (published in *Leading Product Development* by Wheelwright and Clark, 1995) depicts the innovation funnel that all organizations must manage to stay competitive over the years. Firms can fall down at any of the stages of innovation, but this article focuses only on "idea generation"—the stage at the mouth of the funnel. Regrettably, it is also a stage at which many large organizations within the Federal Government fall short.

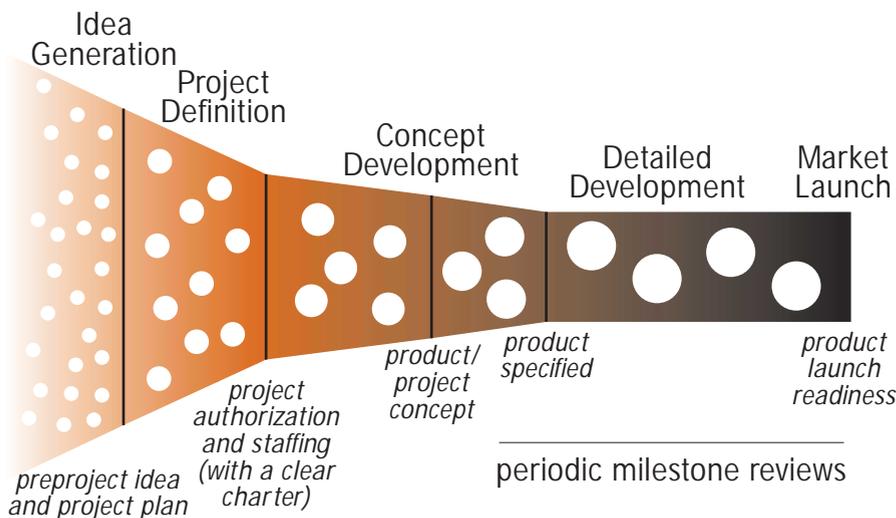
In recognition that our innovation in computing and information technology lags behind the private sector, for example, the Pentagon's Director of Force Transformation is floating "venture capital" projects to provide start-up money for technology firms with good ideas. In the parts of the DoD financed by the Working Capital Fund, "venture capital" programs hold much potential to spur ideas *internally*.

What is Venture Capital?

To be successful, innovation requires not only ideas but also money (i.e., capital) and talent to develop the ideas. Most entrepreneurs cannot finance the business themselves, so they seek capital from a variety of sources. Banks (i.e., commercial lenders) are an important source of start-up financing for new businesses. However, businesses are unlikely to receive bank loans if they lack hard assets (land, buildings, and equipment) for collateral; have large degrees of uncertainty about their future; or will suffer several years of losses prior to earning money.

Venture capitalists accept the high risk of start-ups, but they demand ownership of a large portion of the firms and strict control rights in return for contributing their expertise and a relatively modest amount of money. Entrepreneurs often resist these controls, striving to retain ownership at all costs. They often have little choice, however, if their idea is to be incubated and brought to life. Unfortunately, great ideas often make

Innovation Projects are Managed Through Stages



slow progress without outside capital infusions.

Banks tend to approve one-third or one-fourth of loans requested by established companies, but venture capitalists approve only one out a hundred of the proposals presented to them. Of 10 investments made by a venture capitalist, five may be total write-offs, three may be modest successes, one will double the initial investment, and one will return the investment 50- to 100-fold. Making sure you have a big winner is the goal—not making sure there are no losers. This philosophy runs contrary to the DoD's risk-averse culture.

Discipline is critical for venture capitalists, and any "venture capital" program in the DoD must evaluate ideas with equivalent discipline, even though finance and other business skills are in short supply in the DoD. Even in the private sector, venture capitalists have low rates of return when they tend to take bigger risks and accept lower returns because they feel that the entrepreneur's idea is attractive for "non-financial" reasons. The necessary discipline includes a dry-eyed look at expected revenue—the most important measure of a project's value.

Reward Your Innovators

Your organization's working level, which not surprisingly contains most of your

workforce, has almost all of the potential ideas for innovation. These people are much closer to the technology and warfighter (and to market opportunities) than are upper- or mid-level managers. However, the risk vs. reward trade-off for potential entrepreneurs in most organizations is long on risk and short on reward. Few employees will risk a bruising battle with the defenders of the status quo when our potential payoff is so meager.

The current environment for DoD employees clearly offers only scant incentives to innovators. In many cases, your innovators see a long struggle ahead to win over the bureaucracy—and give up before starting. No wonder few ideas emerge.

Barriers to innovation need to come down, and motivators of innovation need to go way, way up. We want performance awards, visibility, career mobility and progression, promotion, novelty, impact, meaning, exhilaration, wealth, and freedom to run our programs, among other things. Entrepreneurs get all these in, for example, Silicon Valley. "Entrepreneurs" in the DoD get almost none.

Money and control of one's destiny are extremely strong motivators, if Silicon Valley is any example. Employees have to believe that the best way to win big

is to be part of building something new. That means providing additional incentives for employees who are willing to take a risk on something out of the ordinary. It's not enough to remove the barriers—we must positively provide incentives for employees to abandon the familiar for the unconventional.

We, in the DoD, should strongly consider privatizing entrepreneurial teams and giving innovators the chance to become wealthy through their own companies. Spinning-off small parts of the DoD's field activities could be highly motivating to some of the workforce.

But even if a "venture capital" program does not lead to privatization, it provides another source of funds to our budding entrepreneurs, another set of ears to objectively consider the idea, and another option for funding. *The program should provide ideas an easy stroll to acceptance, vs. the uphill struggle and war of attrition they now face.*

Innovation Through Venturing Capital Market

The market for capital in Silicon Valley is nothing like the market for capital in DoD or any other large organization. In a large firm it is almost impossible for someone seven layers down to get a couple hundred thousand dollars to try out a new idea. Capital budgeting at high levels and aversion to risk eliminate any chance that ideas at the working level will be funded in a timely way—but market-driven creativity cannot depend on an annual budget cycle. Pots of money must be "prepositioned" to quickly get the ball rolling whenever ideas are identified. The discipline mentioned earlier means that in years with few good ideas, most of the prepositioned funds get returned to the sponsor.

Top-down resource allocation, and the painstaking financial analysis that underlies it, do have a place in companies and within DoD. It can't be the only game in town, however. It's vitally important to manage the downside risk of big investments in the core business. It's equally important to unleash the ideas

and passion that will create new businesses or transform the core.

Large amounts of money are not necessary to create enormous value. In the United States, the average first-round investment for a start-up is \$500,000. This is for companies that inside of a decade can be valued at over \$1 billion. In WCF organizations, a good project should attract multiple investors from within the organization. The \$500,000 average first-round investment would ensure significant progress; most projects would need far less to start up.

In the private sector, venture capital investors often get a large percentage of the gains (for example, 20 percent) for a finite period of several years, and then the start-up has to pay back the original investment (usually by going public). Venture capitalists might risk 1 percent of the money and get 20 percent of the gain. The internal rate of return of the average venture capital firm is estimated to be about 40 percent. High returns are appropriate for the high risk involved, whether the venture is in the DoD or the private sector.

Depending on the format chosen, the term "venture capital" might describe DoD programs incorrectly. Funding could be provided simply through internal

"loans" (e.g., a funding document from one department to another and an agreement to repay under certain terms). However, this "commercial loan" format includes implicit or explicit guarantees of repayment that are inappropriate for venture efforts; the idea is to motivate the lender to promote the project and lend talent, ideas, and experience to the effort. "Commercial loans" don't do this.

(Note that if the "commercial loan" model is used, the question of collateral must be addressed. If a project is disappointing and expected revenues do not materialize, the "commercial lender" should have rights to assets such as equipment, vehicles, etc., of the borrower.)

Collaboration between the lender and entrepreneur is more likely if the guarantee of repayment is eliminated. Strengthening the financial incentives for a win-win situation should improve communication, teamwork, and relationships. Our lenders need to have a strong interest in seeing the project succeed—in other words, they should lose their investment if the project fails.

To strengthen teaming between branches, etc., and to create a vested interest on both sides, an investment of \$100,000 might require 25 percent of revenues (not principle) be paid to the lender for five years. Failure to generate revenue means the investor loses money; conversely, a hot-selling product makes money for both the lender and entrepreneur.

Specific terms of each transaction are negotiable—a true capital market would not allow monitoring for "fair" agreements. Business acumen will be rewarded and strengthened. Clearly, estimates of revenue and the underlying assumptions will be critical for thorough financial analysis to support investment decisions.

Idea Market

Silicon Valley is tapped into its workforce's creativity like nowhere else. An average-sized venture capital firm in Silicon Valley gets as many as 5,000 unsolicited business plans a year. How many unsolicited business plans does the average senior vice president of a big company get? Five? Ten? Zero?

A constant supply of ideas is critical to venture capital. One could easily argue, however, that our flow of ideas from the DoD's WCF organizations and laboratories is a mere trickle. Instead of creating, we focus only on hammering down costs and outsourcing inefficient processes. Few would disagree that we are in a stewardship mode vs. an entrepreneurial mode, and that the current goal is to get better at what we are already doing. Operational efficiency is the focus.

Being innovative is the exception in the DoD when it should be the rule—an impossible situation to reverse without a market for ideas. This won't happen until large incentives are offered to those who are creative.

Talent Market

The lack of a low-friction "talent market" within our commands will hurt innovation. In Silicon Valley, 20 percent employee turnover is the norm as the most talented move to wherever the most intriguing innovation is occurring. Very few DoD managers

The risk vs. reward trade-off for potential entrepreneurs in most organizations is long on risk and short on reward. Few employees will risk a bruising battle with the defenders of the status quo when our potential payoff is so meager.

will encourage or even allow our best talent to up and leave for six months, especially if the temporary reassignment is to a “competing” organization.

Civilian managers tend to feel “ownership” of their subordinates and want them to continue in their present capacity, regardless of the employee’s ambitions or need for rejuvenation. However, creative and ambitious people trapped in a box will leave—better that they are offered the chance to do something different *within* the command. Unfortunately, managers often put their parochialism above the better good, even though they know that the marginal value a talented employee adds to a business running on autopilot is often a fraction of the value that individual could add to a venture not yet out of the proverbial garage.

Innovation and new ideas tend to come from new voices, so the constant movements of people (i.e., voices) within and between commands will only fuel innovation. Shell Petroleum is an excellent example. According to a Shell manager, “Jobs are listed on Shell’s intranet, and with a two-month notice employees can go and work on anything that interests them. There are no barriers hindering people from going to work on whatever fires their imagination.”

A Monsanto manager said, “Because we don’t have a lot of structure, people will flow toward where success and innovation are taking place. We have a free-market system where people can move, so you have an outflow of people in areas where not much progress is being made.”

Corporate Examples

Private sector corporations often initiate internal “venture capital” programs to spur innovation, where a stated goal is to spin out the new businesses as new companies. Firms spun-out into separate companies are usually controlled by the parent company through stock ownership. This prevents the new company from competing directly with the parent, yet frees the new company from the bureaucracy of the parent and al-

lows the new management to focus more intently on market opportunities. This approach to innovation provides strong motivation for idea generation and internal entrepreneurs—in a word, it’s a way to get rich.

Opportunities exist for DoD to follow the same model and spin-out small, cutting-edge, innovative businesses, but lawyers first need to explore the legal environment; significant changes to statutes would probably be necessary. Initially, the spun-out companies could be owned partly by the government—a situation with ample precedent in most countries today and in U.S. history.

Some will argue that America’s push to shrink government and consolidate the defense industry flies in the face of creating state-owned enterprises. In reality, it is an interim step to shed parts of the DoD while invigorating the marketplace with nimble, entrepreneurial niche players. If equity ownership and control of the new firms are not required, contracts and outright grants can provide the funds to spin-out firms; the U.S. Small Business Investment Company and Small Business Innovation Research programs are relevant models.

Historically, corporate America has perceived venture programs as inviting because corporations, like DoD, extract only a fraction of the value that their Research and Development laboratories generate. Many of the best ideas languish, unused, for a variety of reasons. (A good example here would be internal resistance to compete with existing products or an inability to take advantage of the initial insight.) Venture programs are viewed as an attractive means to get good ideas to the market. Though companies are not required to report efforts in this area, it is estimated that almost all *Fortune 100* companies have venture programs.

WCF “Venture Capital” Programs

A formal process is needed to get our entrepreneurs together with our capitalists. Each level of the organization (Division,

Directorate, Department, and Branch) should be able to seek both funding and investment opportunities.

Setting up an office to focus on “venture capital” is a small price to pay considering the potential payoffs. However, failing to dedicate personnel—at a minimum a part-time panel of experts and “entrepreneurs” who will advocate innovating, funding the best ideas, and coaching the development of action plans—can doom such efforts before they really begin. These dedicated individuals should not be drawn from the ranks of those currently approving resource allocations like military construction, equipment, etc. This would give unorthodox ideas a better chance of being funded.

Defenders of our old business model should not have veto power over new business models. Often, new ideas get squashed for no other reason than that they threaten to cannibalize the revenues of an existing business. For this reason, ideas should not flow up through any managers; ideas should be submitted directly to the team.

Nobody can assume that the next great thing will come from an upper manager running the last great thing. Excusing the vast majority of a workforce from the responsibility of strategic thinking is commonplace, yet tremendously wasteful of talent because those at the top typically are unlikely to generate truly revolutionary ideas. Therefore, the program should be aimed at the working levels (i.e., below GS-13), where the majority of workers and ideas reside.

Encouraging innovation is the primary goal. The toughest problem will be to get our people to submit their ideas. Precious few hoops should be placed in front of prospective “entrepreneurs” to jump through before they receive money. A robust business plan, thorough projections of revenue, etc., are not necessary at the initial stage and would only deter those with ideas. Dedicating a half of a percent of revenue annually to pay passionate people to explore 10 or 20 unconventional ideas, build prototypes,

try new logistics approaches, etc., is peanuts.

For ideas that are not funded or for funded projects that go nowhere, the culture must show appreciation for the attempt. The U.S. economy is robust partly because bankruptcies do not prevent entrepreneurs from starting again; in most of the world, entrepreneurs get only one chance. If we want lots of new ideas, let's reward them.

Get Radical

A persistent, yet unfounded belief pervades our nation's business culture: *that big organizations must always lose to nimble start-ups*. In theory, it should be easier for large companies to re-deploy resources into new areas than for start-ups to plead for funding and induce prospective employees to endure the hassles of changing companies.

Continuous innovation over decades is a prerequisite for long-term existence, but the culture in most WCF organizations fights innovation. A "venture capital" program is one step toward transforming our culture of (non) innovation. But it won't happen unless three interconnected vibrant markets emerge within DoD:

- A market for ideas
- A market for capital
- A market for talent.

The goals are to get ideas flowing, and at the same time get capital and talent flowing spontaneously to the ideas—major challenges within the DoD. In most large companies, ideas, capital, and talent are indolent. They don't move unless someone orders them to move. DoD's record of innovation (and specifically of idea generation) is poor; radical change through the venture capital model or a similar model can move us forward—but dramatically different incentives to the workforce are required.

Editor's Note: The author welcomes questions or comments on this article. Contact him at Lewismr@navsea.navy.mil.

ANTI-TERROR WAR REQUIRES ALL-OUT LOGISTICS EFFORT

Linda D. Kozaryn

WASHINGTON, March 22, 2002—It may be taking a little "magic," but the military's logistics system is keeping up with the demands generated by the war against terrorism, according to Pete Aldridge, Under Secretary of Defense for Acquisition, Technology and Logistics.

Operation Enduring Freedom in Central Asia and Operation Noble Eagle stateside are requiring an all-out effort by the military logistics specialists who provide food, fuel, equipment, spare parts, weapons and ammunition, he told reporters today at a Pentagon roundtable.

"It is stressful; there's no doubt about it," Aldridge said. "We're flying the wings off airplanes and trying to haul fuel into the Afghanistan area and Pakistan basically by airlift, which is a terrible way to do it."

The Under Secretary said he was briefed yesterday by the Defense Logistics Agency, which has been on a 24-hour, seven-day-a-week shift since Sept. 11 to make sure people are getting the supplies they need.

"How they do it? It's magic. But they always do it," he said. "You never hear complaints. If you talk to the customers, they are delighted. They are getting everything they need when they need it."

Aldridge said the number of precision-guided munitions used in the air campaign against terrorist targets caused the military to ask manufacturers to boost production rates. Production is up for both Joint Direct Attack Munitions and laser-guided bomb units, he said.

Usage of the weapons in Afghanistan was above what peacetime stockpiles would support, Aldridge explained. "We've had to go back and readjust the production rates," he said. "We have funding in the emergency [budget] supplemental to make that happen."

Officials said DoD doesn't plan to ask manufacturers to increase the number of facilities, but rather to "tool up" current ones to meet demands. Manufacturers have gone to multiple shifts.

DoD's aims to boost production to the maximum to rebuild stockpiles as quickly as possible, Aldridge said. "The components can only be produced at a certain rate," he noted. "We'll fill (the stockpiles) up as quickly as we can, at what we can afford to do and what the facilities will permit us to do with the components that are available."

He said he's looking at production rates again to see if they're sufficient to provide stockpiles that can handle any future contingency. "That's anybody's guess as to what that might be and where it might be," he said.

Editor's Note: This information is in the public domain at <http://www.defenselink.mil/news>.

NDIA Technology Trends 2003 Conference—Mid-Atlantic Congressional Caucus

Simulation Based Acquisition and DAU Support

DAU Professor Randy Zittel, Northeast and Capital Region campus, was recently invited to speak at Technology Trends 2002 (TechTrends 2002), the annual technology-driven, business development conference and exhibit sponsored by the Strengthening the Mid-Atlantic Region for Tomorrow (SMART) Congressional Caucus and the National Defense Industrial Association (NDIA). TechTrends 2002 was held April 3-4 in Baltimore, Md.

Zittel participated as a panelist on the "Materials, Composites, and Nanotechnology" forum, which focused on using information technology to facilitate collaboration in the development of new materials. He specifically discussed SBA, or Simulation Based Acquisition, the DoD initiative that focuses on using advanced information collaborative technologies.

Leading-edge SBA activities were discussed during the session, including the Aerospace Materials Technology Consortium (AMTC) initiative being led by Naval Air Systems Command (NAVAIR) and the Office of Naval Research with support from the SMART Caucus. AMTC plans to provide a one-stop telecollaborative virtual environment spanning the national aerospace materials community, including government, industry, and academic institutions, to promote national security and competitiveness.

In addition, the Defense Advanced Research Projects Agency (DARPA)-sponsored/NAVAIR-managed Accelerated Insertion of Materials (AIM) Initiative is targeted to streamline the Discovery to Deployment processes for advanced ma-

terials technology through the use of modeling and simulation, and advanced test and engineering methodologies.

While TechTrends 2002 is the third in the TechTrends series, the SMART caucus was formalized in 2001, with Congressmen Rob Andrews (N.J.), Michael Castle (Del.), Steny Hoyer (Md.), and Curt Weldon (Pa.) leading the current 40 members.

U.S. Senator Barbara Mikulski (Md.) and Navy Vice. Adm. Joseph Dyer, Commander, Naval Sea Systems Command (NAVSEA) served as this year's keynote speakers. NAVSEA is also a strong sponsor of the annual commer-

cial conference. A significant number of DoD development agencies within the four-state mid-Atlantic area participated in the vendor exhibitions, showcasing the high-technology initiatives that continue to fuel economic growth in the mid-Atlantic region.

Congressman Weldon, caucus leader for the conference, thanked Zittel and the NDIA conference board of directors for bringing their perspective on advanced technology opportunities to such a broad audience.

For further information on the Congressional SMART Caucus, visit <http://www.smartcaucus.org/>.



From left: Thomas Fenerty, CEO, NAVMAR Applied Sciences Corp; Carl Englebert, NDIA Conference Board of Directors; Congressman Curt Weldon (Pa.); and DAU Professor Randy Zittel.

Photo courtesy NAVMAR Applied Sciences Corp.



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Joint Strike Fighter Attracts More Partners

LINDA D. KOZARYN

WASHINGTON, March 22, 2002—Several more countries intend to become partners in developing the Joint Strike Fighter [JSF], a family of three aircraft designed to replace aircraft in the Air Force, Navy, Marine Corps, and the British military.

“We’ve been very pleased with the response from the international partners on the Joint Strike Fighter,” said Pete Aldridge, Under Secretary of Defense for Acquisition, Technology and Logistics. During a Pentagon roundtable today with reporters, he outlined three levels of participation countries are interested in.

Level 1 is for “highly active partners,” he said, such as the United Kingdom, which has contributed \$2 billion for JSF program development. “They were involved with the source selection process, and they have people in the project office,” he said.

Level 2 partners contribute \$800 million to \$1 billion, he said, and Italy and The Netherlands are in the final processes of approving their partnership. “Their cabinets have approved joining and they’ve now taken it to their parliament. A decision is expected by the second week in April.”

Level 3 partners contribute about \$150 million to participate in the aircraft's development. Aldridge said Canada signed up in February, while Denmark, Norway, and Turkey have announced their intent to join.

Singapore has also expressed interest in the JSF, he said. At a recent air show there, Singaporean officials talked about how they might participate,



A Lockheed Martin X-35A Joint Strike Fighter receives fuel from a KC-135 Stratotanker during a test over California's Mojave Desert.

DoD photo

"whether as an industrial partner or as a participant in some type of study," he said. "We've invited them to come."

U.S. officials expect still more countries will come on board, he said, noting that the number of partners will not affect the aircraft's unit cost. The original estimate was based on the United States and United Kingdom buying a total of 3,000 aircraft.

"We're anticipating that the international buy will be in the thousands," Aldridge added.

The Navy recently completed a tactical air requirements study mandated by the 2001 Defense Planning Guidance. The study "validated the absolute necessity of the Joint Strike Fighter," he said. "They have to have it—both the Navy and the Marine Corps."

The study, which has not yet been reviewed or approved by Defense Department officials, recommends about a 30 percent cut in the number of fighters the Navy and Marine Corps plan to buy. Despite the study's findings, Aldridge assured reporters, "This is not a program that is going down the drain. I'll guarantee you that.

"This study will not have any impact on the force structure of the Navy and Marine Corps until the year 2020," he explained. "It has no effect upon the development program for the next four or five years. It has no effect upon the production program until the year 2012."

It's difficult to predict what the military will need in the year 2020, he said. But the Quadrennial Defense Review process requires DoD officials to "anticipate uncertainty and surprise." It might turn out the military can get by with fewer fight-

ers because of the JSF's "phenomenal" sortie rate, reliability, and availability, he noted.

"The world can change in the next two years," Aldridge said. "That's what happened with the B-2 and the bomber forces." Generally, he noted, the bomber's capabilities these days take second place to its munitions' ability to destroy targets effectively.

U.S. defense officials are pursuing other opportunities for international cooperation. Aldridge said some cooperative programs are already in place, such as the Medium Extended Air Defense System with Germany and Italy, and the Alliance Ground Surveillance System with NATO.

He talked about a group that looks for things [on which to cooperate] that are meaningful in the international arena. "We're looking for opportunities that would make a difference and to do things together without getting into export control hassles," he said.

"We're looking for other opportunities centered around things like unmanned aerial vehicles, air-to-air refueling, and combat identification. We've found our allies are quite good at building smaller, more mobile ships because they have smaller waters to defend. In fact, we're leasing a Norwegian ship and an Australian ship to do some experimentation."

Next month, the United States is hosting a conference on international cooperation with the United Kingdom, France, Germany, and Italy.

"The Joint Strike Fighter is obviously going to be high on everybody's list," Aldridge concluded.

Editor's Note: This information is in the public domain at <http://www.defenselink.mil/news>.

Opportunities for Working Capital Fund Organizations and Their Customers

Six Financial Challenges

DAVID A. BRESLIN

“Who of us would not be glad to lift the veil behind which the future lies hidden; to cast a glance at the next advances of our science and at the secrets of its development during future centuries?”

Thus spoke Professor David Hilbert in 1900 before the International Congress of Mathematicians in Paris, as he presented 23 unsolved mathematical problems to his colleagues and the world.

Hilbert, who was a brilliant mathematician, wanted to challenge his colleagues in areas that would yield rich rewards by advancing the science of mathematics. So Hilbert presented a set of problems designed specifically to accomplish that goal. He knew the problems must have solutions; he and his colleagues just didn't know what those solutions were. And he realized the enrichment of the science of mathematics did not come necessarily from the solutions themselves, but rather from the pursuit of those solutions. History proved him to be right.

But the purpose here is not to talk about mathematical problems. Rather, the purpose here is to make an attempt at applying Hilbert's approach to financial challenges facing Working Capital Fund (WCF) organizations.

Breslin is the Director of Technical Operations, Naval Surface Warfare Center, Naval Sea Systems Command, Washington, D.C. He is a graduate of the Program Management Course (PMC 93-1), Defense Systems Management College, Fort Belvoir, Va.



Why?

Today's WCF organizations face financial challenges. These are not challenges from a perspective that such organizations are somehow financially challenged. Quite the contrary—these are challenges from a perspective that the business environment of WCF organizations continues to evolve and, therefore, the financial tools employed by these organizations must evolve, too. The evolution never ceases.

Behind these challenges lie opportunities for cost avoidance and improved efficiencies—all to the benefit of the customer and the program manager. Behind these challenges lie the best business practices being called for by the Secretary of Defense, the authors of the *Quadrennial Defense Review*, and countless others.

The economics of a WCF is not treated today as a science. But that doesn't mean it shouldn't be. Maybe it should be, and maybe we should follow Hilbert's example. Like Hilbert's mathematical problems, solutions to certain financial challenges currently elude us. Given enough time and effort, however, solutions can be found.

Although mathematical in nature, the financial challenges presented here are significantly different from Hilbert's 23 unsolved mathematical problems. The solutions to these challenges do not require great genius. In most cases, it's as simple as applying commercial practices to government organizations.

Nevertheless, these challenges are important and finding solutions may greatly benefit the way in which business is done. If for no other reason, solutions should be sought because *public service is a public trust*.

Working Capital Fund

Let's start with a brief summary on the economics of a WCF, which relies on sales revenue rather than direct appropriations to finance its continuing operations. The mechanics are really quite

simple. A WCF intends to: 1) generate sufficient revenue to cover the full costs of its operations, and 2) operate on a break-even basis over time (no profit and no loss).

Customers, who generally can choose where to purchase services, use appropriated funds to finance orders placed with a WCF organization. So in a sense, a WCF organization operates very much like a private business, except for the absence of profit. In fact, it's designed to work that way, as a means of providing managers with a powerful incentive to control costs and satisfy customers.

Life, of course, does not work as perfectly as theory, and WCF organizations occasionally wind up at the end of the fiscal year with a profit or a loss. Profit at the end of the year indicates that customers paid too much for products and services, resulting in a gain to the WCF. Profits are returned to customers by a forced reduction in the future labor rates charged to customers. Loss at the end of the year means that customers paid too little, resulting in a drain to the WCF. Losses are recovered by increasing the future labor rates charged to customers. It's as simple as that.

Six Financial Challenges

So what are some of the financial challenges facing WCF organizations? The reader may recognize that all of the challenges are interrelated and should recognize that solving these challenges could yield a holistic way of managing the business of the organization.



Many organizations have come to find that official budget submittals, which rely heavily on information from program managers and other customers concerning future orders, tend to reflect something quite different from reality.

Per Capita Contributions to U.S. Growth Rates— 1929 to 1982

Contributions Due To	Percent Contribution
Labor Input Except Education	-12%
Education	27%
Capital	20%
Advances in Knowledge	55%
Improved Resource Allocation	16%
Economies of Scale	18%
Other	-24%

From Denison, Trends in American Economic Growth, 1929 - 1982, Brookings Institution

Challenge 1—Projecting Future Revenues with High Precision

A basic necessity of any large business is to know the future business base *a priori*. Otherwise, meaningful and efficient planning in critical investment areas such as hiring, capital equipment, infrastructure, and so on is all but impossible. As instructed by John Kenneth Galbraith, uncertainty in the planning sector is despised.

For a WCF organization, the future business base is whatever's contained in official budget submittals. And many organizations have come to find that official budget submittals, which rely heavily on information from program managers and other customers concerning future orders, tend to reflect something quite different from reality. But if investment decisions made today are based on inaccurate revenue projections, how good are those investment decisions, and what is the impact on the organization? The answer is only too obvious.

Some existing techniques, primarily statistical, can be applied to improve our knowledge of things such as future revenues. For example, the difference between historical projections of revenue and actual revenues can be looked upon statistically as *errors*. In certain cases, and with a sufficient database of historical errors, today's official budget projections can be *corrected*, yielding a more accurate view of the future. Standard regression techniques can also help further *correct* official budget projections when some future orders are in fact known *a priori*. And of course, still other available regression techniques can be applied to take advantage of underlying processes (such as customer habits) when they become known.

None of this would change official budget submittals. But this would give the decision maker a more accurate view of the future. So the challenge here is to apply accepted mathematical tools to develop an expected value of revenue as a means of knowing the future and making better-informed investment decisions.



Challenge 2—Optimizing Cash on Hand

Cash is a non-earning asset and, therefore, cash balances should be minimized. The sooner cash is spent, the sooner it begins working for the organization. Therefore, cash on hand incurs an *opportunity* cost.

This is a good rule from a business school, but how does it apply to a WCF organization? Some WCF organizations maintain sizeable cash balances during the year as a means of avoiding risk. After all, what if expected revenues later in the fiscal year fail to materialize, thus causing the organization to end the year in the red? As previously discussed, a loss is compensated for by increases to labor rates, perhaps driving future business away and introducing the ever-feared *Death Spiral* (see Challenge 3). That's the cost of *illiquidity* in the WCF

So having too much money on hand incurs an *opportunity* cost, but not having enough money on hand incurs costs of *illiquidity*. What's the optimal balance?

As long as a WCF organization ends up even at the end of the year (no profit, no loss), running cash balances can be zero, or perhaps even negative. Then again, WCF organizations must maintain reasonable cash buffers to protect against possible losses (the probability of such a loss might be determined from Challenge 1). So an optimal balance

must be found between minimizing cash balances and maintaining a sufficient buffer as a means of managing risk. At the beginning and end of the year, the cash on hand is theoretically zero. In the middle of the year, it's something else. All of this suggests the existence of a continuous, probabilistic, time-dependent function that, by the way, is unique for each WCF organization. So what is that function?

Challenge 3—Challenging the Paradigm of the Death Spiral

This challenge to some extent contradicts a premise of Challenge 2. The *Death Spiral* is well known in WCF organizations, often spoken of, and goes something like this: "For whatever reason, an organization loses money one year." The labor rates are then adjusted upward in the future to compensate for that loss. The increasing labor rates drive customers and business away, which in the WCF environment is the cost of *illiquidity*, and results in ever-increasing losses. Labor rates and accumulated losses, thus coupled, spiral ever upward and out of control and the organization flies apart financially, not entirely unlike an under-damped, spring-mass system operating at a fundamental frequency.

Managers of WCF organizations make business decisions with the fear of the *Death Spiral* in mind. But what if the *Death Spiral* is fiction, or at least over-rated? Then managers essentially are making business decisions, such as whether to make or defer a large capital investment, based on the false premise, "better to defer that large investment lest we risk falling into the *Death Spiral*." The *Death Spiral* is certainly real. What one needs to question is to what extent the *Death Spiral* exists?

Private industry has long recognized that in many circumstances customers have a range of price indifference, wherein the decision to buy is not affected by price. There is probably a similar range of price indifference for customers who buy labor from WCF organizations, meaning that the cost of *illiquidity* might

be less than one thinks. This is not to suggest that organizations should behave recklessly and needlessly subject customers to the risk of higher rates. Rather, this is to suggest that there may be room for greater risk to the ultimate, long-term benefit of the customer.

Determining whether such a range of price indifference exists, based on neo-Keynesian principles, and understanding its limits would allow managers to make better-informed business decisions.

Challenge 4—Optimizing the Allocation of Financial Resources

Throughout DoD, decisions on where to make discretionary investments often rely upon multi-attribute decision-making techniques. Multi-attribute decision making is an operations research technique whereby individual alternatives are objectively valued. (The details of this technique are widely known and will not be discussed here.)

Multi-attribute decision making works very well when one is attempting to identify the single best investment alternative. It's very popular because of its simplicity and the fact that it so closely mimics cognitive processes. Unfortunately, multi-attribute decision making is often misapplied.

When a manager is trying to identify a *portfolio* of investment alternatives, higher-level techniques such as integer programming must be employed. Otherwise, the selected portfolio of investments can be significantly sub-optimized. One challenge of using higher-level techniques, such as integer programming, is that the results are often counter-intuitive, making managers suspicious.

Mostly one thinks of the physical plant (capital equipment, military construction, minor construction, maintenance and repair) when thinking of discretionary investments. However, discretionary investments also include hiring, training, and distribution of high-grade authority. The challenge here is to apply more advanced resource allocation tech-

niques to the processes by which managers make their investment decisions as a means of getting more value for the organization and, ultimately, the customer.

Of course, one should keep in mind that this does not even begin to address how an investment alternative should be valued in the first place.

Challenge 5—Valuing Investment Alternatives

Challenge 1 justifies that uncertainty in the planning sector is despised. But that's not always the case. Increasingly, uncertainty is actually being leveraged by the planning sector for competitive advantage.

Very often, high degrees of certainty surround investment options, especially in government. In other words, the costs and benefits of a potential investment are known. In these cases, linear valuation methods such as net present value are appropriately employed to support investment decisions. But what does one do when high degrees of uncertainty surround investment options? As has been found in the pharmaceutical industry and other sectors of the economy, standard linear valuation methods can yield erroneous results. In these cases, non-linear methods for valuing investment options must be considered.

Let's take an excursion for a moment and think about stock options. An option is the right, but not the obligation, to take an action in the future. A stock option often consists of Party A promising to sell stock at a specified price to Party B at a future date. Until that future date, the value of the option rises and falls as the expected value of the stock in question rises and falls. Party B has choices. Party B can ignore the option, sell the option to a third party, or exercise the option to buy at the specified price at a future date. Buying and selling options is a big business; and now an entire industry surrounds the *valuing* of options or option pricing.

Now, think for a moment about the decision to maintain and invest in a facil-

ity, capability, or project; or to sell or abandon a facility, capability, or project. Each of these decisions is akin to making a decision on a stock option. Each is called a *Real Option*.

If we're talking about a facility, the facility may be a Research and Development (R&D) facility, a depot facility, or some other type of facility. Irrespective of the type of facility, a facility can have an unknown future value, like the unknown future value of a stock. For example, an R&D facility may (or may not) achieve a major breakthrough several years hence, yielding extremely high value for the programs it supports. A depot facility may (or may not) possess a surge capacity that is absolutely critical during conflict. This is where uncertainty comes in. As such, a facility can have some future value to the DoD that is unknown *a priori*.

When uncertainty is present, linear methods such as net present value can grossly underestimate the value of an option, leading the decision maker to miss incredible investment opportunities. In such cases probabilistic methods can be employed to determine the true value of an option. And using non-linear techniques to value these investment options can lead to better decisions.

Private industry has leveraged these methods with amazing success. But how does one effectively apply these non-linear methods to a WCF organization?

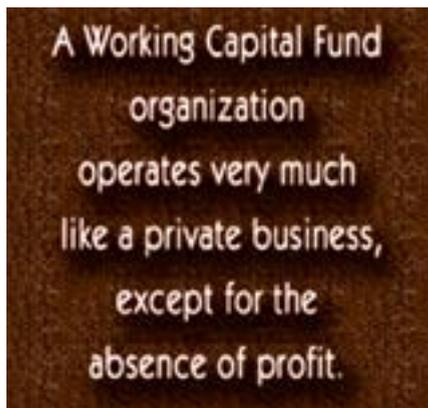
Challenge 6—Measuring and Managing Workforce Productivity

For the most part, federal employees do not contribute directly to Gross Domestic Product (GDP). That's because federal employees, for the most part, do not produce those things that are counted under the heading of GDP. So economists have generally ignored the productivity of federal employees, and traditional methods of measuring workforce productivity (essentially GDP per labor hour, or output over input) do not apply. Nevertheless, federal employees are productive, changes in their productivity do occur, and increases in their

productivity enhance the value of the organization to customers and the DoD.

The difficulty lies in how the output of employees is valued. The product that customers of white-collar, WCF organizations usually purchase is labor hours (h_1). That's the input. The value of those labor hours or *output* to the customer is assumed equal to the cost of those hours, based on the labor rate ($h_1 \times r_1$). After adjusting for inflation, the cost of labor does not change appreciably, and the *output over input* ($h_1 \times r_1 / h_1 = r_1$) does not change appreciably, thus leaving perceived productivity relatively flat. The error lies in assuming the value of the output is equal to the cost of the applied labor hours, when in reality the value may be (and better be) much, much more.

So, what the changes in productivity in white-collar, WCF environments are, and more important, what contributes to changes in productivity are mostly unknown to us. The challenge here is to find ways of measuring productivity and to identify those things that most contribute to increased productivity. The table on p. ___ applies to the U.S. economy overall from 1929 to 1982. Imagine if a manager possessed similar knowledge for a WCF organization.



Knowing what things contribute most to increased productivity would allow that manager to allocate resources much more effectively to the ultimate benefit of the organization and the customer.

So, how does one measure productivity and the contributors to productivity in a WCF organization?

The Way Ahead

As with Hilbert a hundred years ago, the challenges presented here are not intended to represent the complete set of challenges facing WCF organizations today and in the future. It's certainly not an exhaustive list. In fact, some of the challenges presented here may be worded incorrectly and may not even be the correct ones, in that the benefit of pursuing a solution is lacking.

But as with Hilbert a hundred years ago, the challenges presented here are intended to provoke thoughtful consideration of where we are, where we could go, and how we might get there. They are intended to provoke us into viewing and treating the economics of the WCF as the legitimate science it is. Solving these six challenges could lead ultimately to some sort of *Unified Field Theory* for the economics of a WCF.

Hilbert challenged mathematicians to think axiomatically, and the results were phenomenal. We should challenge ourselves to do no less. The opportunities for improving financial management appear unlimited, and we should be grateful that these types of challenges exist. After all, as Hilbert said:

"As long as a branch of science offers an abundance of problems, so long is it alive; a lack of problems foreshadows extinction or the cessation of independent development."

May the economics of the WCF thrive!

Editor's Note: The author welcomes questions or comments on this article. Contact him at BreslinDA@navsea.navy.mil.

DoD Awards \$45 Million to Universities for Research Equipment

The Department of Defense (DoD) plans to award \$45 million to academic institutions to support the purchase of research instrumentation. The 209 awards to 102 academic institutions are expected to range from about \$50,000 to \$1 million and average \$213,000. All awards are subject to the successful completion of negotiations between DoD research offices and the academic institutions.

The awards are made under the Defense University Research Instrumentation Program (DURIP). The DURIP supports the purchase of state-of-the-art equipment that augments current capabilities or develops new university capabilities to perform cutting-edge defense research.

The DURIP meets a critical need by enabling DoD-supported university researchers to purchase scientific equipment costing \$50,000 or more. The researchers generally have difficulty purchasing instruments costing that much under research contracts and grants.

This announcement is the result of a merit competition for DURIP funding conducted by four research offices: the Army Research Office, Office of Naval Research, Air Force Office of Scientific Research, and the Advanced Technology Development Directorate of the Missile Defense Agency. The offices solicited proposals from university investigators working in areas of importance to the DoD, such as information technology, remote sensing, propulsion, electronics and electro-optics, advanced materials, and ocean science and engineering. In response to the solicitation, the research offices received 733 proposals requesting \$192 million in support for research equipment.

The complete list of winning proposals is on the Web at <http://www.defenselink.mil/news/Mar2002/d20020320dur.pdf>.

Editor's Note: This information is in the public domain at <http://www.defenselink.mil/news>.

May 2002 Marks Last Offering for DAU's 14-Week Advanced Program Management Course



Gary Hitt, DAU Chief of Facilities Maintenance at Fort Belvoir, Va., hangs a banner over Scott Hall welcoming students attending DAU's last Advanced Program Management Course (APMC 02-2), which began May 13. The 14-week Advanced Program Management Course, which has been the University's flagship course in program management since 1995, is being replaced by the new PMT-352,

Program Management Office Course. The new PMT-352, designed to provide acquisition managers with Level III certification in program management, consists of 50 hours of Internet lessons over 60 days, and six weeks of resident classroom instruction. APMC's predecessor was the 20-week Program Management Course (PMC), which was first offered at the Defense Systems Management School in 1971.



DoD Releases Selected Acquisition Reports

The Department of Defense has released details on major defense acquisition program cost and schedule changes since the September 2001 reporting period. This information is based on the Selected Acquisition Reports (SARs) submitted to the Congress for the Dec. 31, 2001 reporting period.

SARs summarize the latest estimates of cost, schedule, and technical status. These reports are prepared annually in conjunction with the President's budget. Subsequent quarterly exception reports are required only for those programs experiencing unit cost increases of at least 15 percent or schedule delays of at least six months. Quarterly SARs are also submitted for initial reports, final reports, and for programs that are rebaselined at major milestone decisions.

The total program cost estimates provided in the SARs include research and development, procurement, military construction, and acquisition-related operation and maintenance (except for pre-Milestone B programs, which are limited to development costs pursuant to 10 USC §2432). Total program costs reflect actual costs to date as well as future anticipated costs. All estimates include anticipated inflation allowances.

The current estimate of program acquisition costs for programs covered by SARs for the prior reporting period (Sept. 2001) was \$790,402.3 million. After subtracting the costs for final reports and adding the costs for five new programs—Active Electronically Scanned Array (AESA), Global Hawk, Joint Simulation System (JSIMS), T-AKE, and Wideband Gapfiller—in September 2001, the adjusted current estimate of program acquisition costs was \$796,795.5 million. There was a net cost increase of \$133,327.7 million or 18.2 percent during the current reporting period (December 2001). However, since 56 programs of the 70 programs reported here did not update their outyear budget streams since the December 1999 reporting period, most of this growth has oc-

curred over a two-year period vice a three-month period. As in past net cost increase calculations, funds have been excluded for programs submitting new ("initial") SARs. For this SAR submission cycle, these programs are C-130 Avionics Modernization Program (AMP), C-5 Reliability [Enhancement] and Re-Engining Program (RERP), Ballistic Missile Defense System (BMDS), and Blackhawk Upgrade (UH-60M).

This increase was due primarily to higher program estimates (+\$56.1 billion), additional engineering changes (hardware/software) (+\$19.2 billion), and a net stretch-out of the development and procurement schedules (+\$8.2 billion). There was also a net increase in the planned quantities to be purchased (+\$42.8 billion) along with the associated support costs (+\$11.8 billion). These increases were partially offset by the application of lower escalation indices (-\$4.9 billion).

For more details on cost changes and other SAR information, see the following Web links:

Summary Table

<http://www.defenselink.mil/news/Apr2002/d20020411summary.pdf>

Summary Explanations of Significant SAR Cost Changes

<http://www.defenselink.mil/news/Apr2002/d20020411changes.pdf>

SAR Program Acquisition Cost Summary in Dollars

<http://www.defenselink.mil/news/Apr2002/d20020411costs.pdf>

Acronyms

<http://www.defenselink.mil/news/Dec2001/d20011207acronym.pdf>

Editor's Note: This information is in the public domain at <http://www.defenselink.mil/news>.

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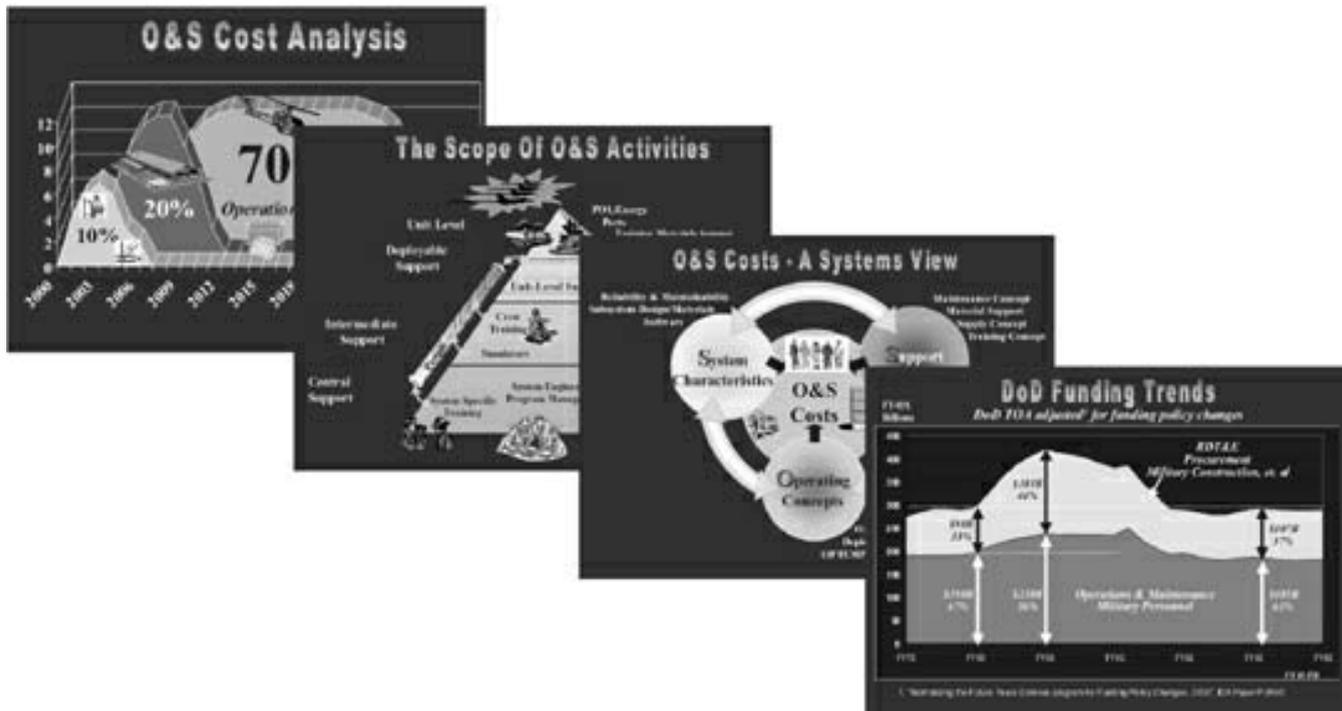
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DoD Certifies Six Acquisition Programs

JIM GARAMONE

WASHINGTON (May 3, 2002—The Defense Department has certified six acquisition projects to Congress under the Nunn-McCurdy Law.

The certification allows the programs to move forward, said Pete Aldridge, Defense Under Secretary for Acquisition, Technology and Logistics, during a press roundtable May 2.

The Nunn-McCurdy Law requires the Secretary of Defense to certify that programs with a 25 percent cost increase are necessary for national security. It also mandates the Department put controls in place to get costs under control.

Programs not certified are canceled. The most recent—and so far, only—case of that was the Navy's Area Terminal Defense System in December.

Aldridge said four criteria are used for certifications: Is the program essential for national security? Is there an equally capable, lower-cost alternative available? Are costs under control? Is there management in place to keep spending under control?

He certified all six programs that ran into Nunn-McCurdy limits.

The first is the H-1 helicopter. DoD is "remanufacturing" 280 H-1 replacements for the AH-1 Cobra and for the UH-1 Huey, Aldridge said. The plan calls for the Huey and Cobra to have common engines, tail rotors, and other components. "So there's a great logistics benefit from having commonality of the two approaches," he said, adding alternatives are "vastly more expensive."

Aldridge also certified the CH-47 Chinook helicopter program. "We're going to remanufacture 317 CH-47s for the heavy lift helicopter replacement," he said. "Every alternative was two to three times more expensive."

The LPD-17 Amphibious Transport Dock Ship program is also certified. There are four ships under contract, leading to a 12-ship buy. "Ninety-five percent of the design has been completed," Aldridge said. "Most of the problems are behind us."

Aldridge had to certify the chemical demilitarization program because it's governed by treaty. He said DoD continues to examine alternative technologies to accelerate the process.

The Multiple-Launch Rocket System [MLRS] upgrade program also gained certification. Upgrades include improved launchers, the development of a GPS [Global Positioning System] guidance system, and extended missile range, he said. MLRS is a joint program with Germany, Italy, France, and the United Kingdom.

The last of the six is the Space-based Infrared System-High. "This is the replacement for the current ballistic missile early-warning system with the added requirements for technical intelligence and missile defense," Aldridge said. "This is essential for national security. The alternatives were much more expensive given the state of the current program."

Editor's Note: This information is in the public domain at <http://www.defenselink.mil/news>.

Even Pharaoh Needed a Good Program Manager... Attend the Defense Acquisition University for AT&L Workforce Training

DAU Visual Arts and Press Director Greg Caruth (right) debuts DAU's newest exhibit at FOSE 2002 on March 19. FOSE is the annual Federal Office Systems Exhibition for government employees and defense industry, held in the D.C. Convention Center. Caruth, who has served the University as art director for nearly three decades, designed and developed this year's exhibit. He has designed a number of exhibits over the years—all of them unique, and all of them show stoppers. Pharaoh is Mike Dorton.

DAU photo

READ ABOUT THE LATEST IN TECHNOLOGY DEVELOPMENTS VISIT THE ONLINE VIRTUAL TECHNOLOGY EXPO AT [HTTPS://VTE.DTIC.MIL](https://vte.dtic.mil)

Studies over the past 10 years have highlighted the difficulties in transferring technology from research laboratories to development organizations. In 1999, the Deputy Under Secretary of Defense (Science and Technology) sponsored the development of an automated tool to facilitate technology transition. The Virtual Technology Expo (VTE) went into production in October 2000. Designed to advise the Requirements and Acquisition communities of new technology developments, the VTE contains descriptions of technology advancements and points of contact for obtaining more detailed information.

The technology database is provided as a restricted service through the World Wide Web (<https://vte.dtic.mil>). While the database is currently available, upon registration, only to U.S.

government employees and their contractors, an enhancement will soon be completed to protect several levels of information sensitivity. At that time, access will be expanded to include industry, academia, and international technology partners.

VTE users may locate information by selecting Defense Technology Areas or Joint Warfighting Capabilities; by searching the text of technology descriptions for specific criteria; or by finding the organization or point of contact for research projects. Likewise, they may submit technology project descriptions along with multimedia documents, presentations, pictures, diagrams, and videos.

Communication is key! With the participation of the Science and Technology, Requirements, and

Acquisition communities, the VTE can expand its database of information to include many sources of technology research. This consolidated database should enable users to:

- Plan for future technology upgrades.
- Monitor commercial technology and product development.
- Find technologies that may enhance military capabilities.
- Choose which technologies to leverage and which to develop with their own resources.
- Develop and refine requirements.
- Prepare analysis of alternatives assessments.
- Showcase research efforts to a wider audience.

For additional information, send an email to vte_help@dtic.mil.



ACQUISITION & LOGISTICS EXCELLENCE

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Surfing the Net

DEPARTMENT OF DEFENSE

Under Secretary of Defense (Acquisition, Technology and Logistics) (USD-AT&L)

<http://www.acq.osd.mil/>
ACQWeb offers a library of USD(AT&L) documents, a means to view streaming videos, and jump points to many other valuable sites.

Director, Acquisition Initiatives (AI)

<http://www.acq.osd.mil/ar>
Acquisition news and events; reference library; AI organizational breakout; acquisition education and training policy and guidance.

DoD Inspector General

<http://www.dodig.osd.mil/pubs/index.html>
Search for audit and evaluation reports, Inspector General testimony, and planned and ongoing audit projects of interest to the acquisition community.

Deputy Director, Systems Engineering, USD (AT&L/IO/SE)

<http://www.acq.osd.mil/io/se/index.htm>
Systems engineering mission; Defense Acquisition Workforce Improvement Act information, training, and related sites; information on key areas of systems engineering responsibility.

Defense Acquisition Deskbook

<http://web1.deskbook.osd.mil>
Automated acquisition reference tool covering mandatory and discretionary practices.

Defense Acquisition History (DAH) Project

<http://www.army.mil/cmh-pg/acquisition/acqhome.htm>
The DAH Project is a multi-year program to produce a detailed history of defense acquisition since 1947, to be published in six volumes. The site features a quarterly online newsletter, project status announcements, acquisition history links, and contact information.

Defense Acquisition University (DAU)

<http://www.dau.mil>
DAU Course Catalog, *Program Manager* magazine and *Acquisition Review Quarterly* journal; course schedule; policy documents; and training news from the Defense Acquisition Workforce.

Defense Acquisition University Virtual Campus

<https://dau1.fedworld.gov>
Take DAU courses online at your desk, at home, at your convenience!

Army Acquisition Corps (AAC)

<http://dacm.rdaisa.army.mil>
News; policy; publications; personnel demo; contacts; training opportunities.

Army Acquisition

<http://acqnet.saalt.army.mil>
A-MART; documents library; training and business opportunities; past performance; paperless contracting; labor rates.

Navy Acquisition Reform

<http://www.ar.navy.mil>
Acquisition policy and guidance; World-class Practices; Acquisition Center of Excellence; training opportunities.

Navy Acquisition, Research and Development Information Center

<http://nardic.onr.navy.mil>
News and announcements; acronyms; publications and regulations; technical reports; "How to Do Business with the Navy"; much more!

Naval Sea Systems Command

<http://www.navsea.navy.mil/sea017/toc.htm>
Total Ownership Cost (TOC); documentation and policy; Reduction Plan; Implementation Timeline; TOC reporting templates; Frequently Asked Questions.

Navy Acquisition and Business Management

<http://www.abm.rda.hq.navy.mil>
Policy documents; training opportunities; guides on areas such as risk management, acquisition environmental issues, past performance, and more; news and assistance for the Standardized Procurement System (SPS) community; notices of upcoming events.

Navy Best Manufacturing Practices Center of Excellence

<http://www.bmpcoe.org>
A national resource to identify and share best manufacturing and business practices being used throughout industry, government, and academia.

Space and Naval Warfare Systems Command (SPAWAR)

<https://e-commerce.spawar.navy.mil>
Your source for SPAWAR business opportunities, acquisition news, solicitations, and small business information.

Joint Interoperability Test Command (JITC)

<http://jitc.fhu.disa.mil>
Policies and procedures for interoperability certification. Access to lessons learned; link for requesting support.

Air Force (Acquisition)

<http://www.safaq.hq.af.mil/>
Policy; career development and training opportunities; reducing TOC; library; links.

Air Force Materiel Command (AFMC) Contracting Laboratory's Federal Acquisition Regulation (FAR) Site

<http://farsite.hill.af.mil/>
FAR search tool; *Commerce Business Daily* Announcements (CBDNet); *Federal Register*; Electronic Forms Library.

Defense Systems Management College (DSMC)

<http://www.dsmc.dau.mil>
DSMC educational products and services; course schedules; job opportunities.

Defense Advanced Research Projects Agency (DARPA)

<http://www.darpa.mil>
News releases; current solicitations; "Doing Business with DARPA."

Defense Information Systems Agency (DISA)

<http://www.disa.mil>
Structure and mission of DISA; Defense Information System Network; Defense Message System; Global Command and Control System; much more!

National Imagery and Mapping Agency

<http://www.nima.mil>
Imagery; maps and geodata; Freedom of Information Act resources; publications.

Defense Modeling and Simulation Office (DMSO)

<http://www.dmsomil>
DoD Modeling and Simulation Master Plan; document library; events; services.

Defense Technical Information Center (DTIC)

<http://www.dtic.mil/>
Technical reports; products and services; registration with DTIC; special programs; acronyms; DTIC FAQs.

Defense Electronic Business Program Office (DEBPO)

<http://www.defenselink.mil/acq/ebusiness/>
Policy; newsletters; Central Contractor Registration; Assistance Centers; DoD EC Partners.

Open Systems Joint Task Force

<http://www.acq.osd.mil/osjtf>
Open Systems education and training opportunities; studies and assessments; projects, initiatives and plans; reference library.

Government Education and Training Network (GETN) (For Department of Defense Only)

<http://atn.afit.af.mil>
Schedule of distance learning opportunities.

Government-Industry Data Exchange Program (GIDEP)

<http://www.gidep.corona.navy.mil>
Federally funded co-op of government-industry participants, providing an electronic forum to exchange technical information essential to research, design, development, production, and operational phases of the life cycle of systems, facilities, and equipment.



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Surfing the Net

FEDERAL CIVILIAN AGENCIES

Acquisition Reform Network (ARNET)

<http://www.arnet.gov/>

Virtual library; federal acquisition and procurement opportunities; best practices; electronic forums; business opportunities; acquisition training; Excluded Parties List.

Committee for Purchase from People Who are Blind or Severely Disabled

<http://www.jwod.gov>

Provides information and guidance to federal customers on the requirements of the Javits-Wagner-O'Day (JWOD) Act.

Federal Acquisition Institute (FAI)

<http://www.faionline.com>

Virtual campus for learning opportunities as well as information access and performance support.

Federal Acquisition Jump Station

<http://nais.nasa.gov/fedproc/home.html>

Procurement and acquisition servers by contracting activity; CBDNet; Reference Library.

Federal Aviation Administration (FAA)

<http://www.asu.faa.gov>

Online policy and guidance for all aspects of the acquisition process.

General Accounting Office (GAO)

<http://www.gao.gov>

Access to GAO reports, policy and guidance, and FAQs.

General Services Administration (GSA)

<http://www.gsa.gov>

Online shopping for commercial items to support government interests.

Library of Congress

<http://www.loc.gov>

Research services; Congress at Work; Copyright Office; FAQs.

National Technical Information Service (NTIS)

<http://chaos.fedworld.gov/onow/>

Online service for purchasing technical reports, computer products, videotapes, audiocassettes, and more!

Small Business Administration (SBA)

<http://www.SBAonline.SBA.gov>

Communications network for small businesses.

U.S. Coast Guard

<http://www.uscg.mil>

News and current events; services; points of contact; FAQs.

TOPICAL LISTINGS

Committee for Purchase From People Who are Blind or Severely Disabled

<http://www.jwod.gov>

Provides information and guidance to federal customers on the requirements of the Javits-Wagner-O'Day (JWOD) Act.

MANPRINT (Manpower and Personnel Integration)

<http://www.MANPRINT.army.mil>

Points of contact for program managers; relevant regulations; policy letters from the Army Acquisition Executive; as well as briefings on the MANPRINT program.

DoD Specifications and Standards Home Page

<http://www.dsp.dla.mil>

All about DoD standardization; key Points of Contact; FAQs; Military Specifications and Standards Reform; newsletters; training; nongovernment standards; links to related sites.

Risk Management

http://www.acq.osd.mil/io/se/risk_management/index.htm

Risk policies and procedures; risk tools and products; events and ongoing efforts; related papers, speeches, publications, and Web sites.

Earned Value Management

<http://www.acq.osd.mil/pm>

Implementation of Earned Value Management; latest policy changes; standards; international developments; active notebook.

Fedworld Information

<http://www.fedworld.gov>

Comprehensive central access point for searching, locating, ordering, and acquiring government and business information.

GSA Federal Supply Service

<http://pub.fss.gsa.gov>

The No. 1 resource for the latest services and products industry has to offer.

Commerce Business Daily

<http://www.govcon.com/>

Access to current and back issues with search capabilities; business opportunities; interactive yellow pages.

INDUSTRY AND PROFESSIONAL ORGANIZATIONS

DAU Alumni Association

<http://www.dauaa.org>

Acquisition tools and resources; government and related links; career opportunities; member forums.

Electronic Industries Alliance (EIA)

<http://www.eia.org>

Government Relations Department; includes links to issue councils; market research assistance.

National Contract Management Association (NCMA)

<http://www.ncmahq.org>

"What's New in Contracting?"; educational products catalog; career center.

National Defense Industrial Association (NDIA)

<http://www.ndia.org>

Association news; events; government policy; *National Defense* magazine.

International Society of Logistics

<http://www.sole.org/>

Online desk references that link to logistics problem-solving advice; Certified Professional Logistician certification.

Computer Assisted Technology Transfer (CATT) Program

<http://catt.bus.okstate.edu>

Collaborative effort between government, industry, and academia. Learn about CATT and how to participate.

Software Program Managers Network

<http://www.spmn.com>

Site supports project managers, software practitioners, and government contractors. Contains publications on highly effective software development best practices.

Association of Old Crows (AOC)

<http://www.crows.org>

Association news; conventions, conferences and courses; *Journal of Electronic Defense* magazine.



If you would like to add your acquisition or acquisition and logistics excellence-related Web site to this list, please put your request in writing and fax it to Sylvia Gasiorek-Nelson, (703) 805-2917. DAU encourages the reciprocal linking of its Home Page to other interested agencies. Contact the DAU Webmaster at: webmaster@dau.mil.

Program Manager Writer's Guidelines in Brief (<http://www.dau.mil/pubs/pm/articles.asp>)

Purpose

The purpose of *Program Manager* Magazine is to instruct members of the DoD Acquisition, Technology & Logistics (AT&L) Workforce and Defense Industry on policies, trends, legislation, senior leadership changes, events, and current thinking affecting program management and defense systems acquisition, and to disseminate other information pertinent to the professional development and education of the DoD Acquisition Workforce.

Subject Matter

Subjects may include, but are not restricted to, all aspects of program management; professional and educational development of DoD's AT&L Workforce; acquisition and logistics excellence; Defense industrial base; research and development; test and evaluation; modeling and simulation; commercial best business practices; and interviews with Government-Industry Defense executives.

Program Manager is not a forum for academic papers, fact sheets, technical papers, or white papers (these are typically recognized by their structured packaging, e.g., Introduction, Background, Discussion, Methodology, Recommendations, Conclusions). Such papers are more suited for DAU's journal, *Acquisition Review Quarterly*. *Program Manager* Magazine publishes, for the most part, feature stories that include real people and events. Stories that appeal to our readers—who are senior military personnel, civilians, and defense industry professionals in the program management/acquisition business—are those taken from real-world experiences vs. pages of researched information.

Good writing sounds like comfortable conversation. Write naturally and avoid stiltedness. Except for a rare change of pace, most sentences should be 25 words or less, and paragraphs should be six sentences. Vary your syntax. Avoid falling into the trap of writing one declarative sentence after another. Package your article with liberal use of subheads.

Length of Articles

Program Manager is flexible regarding length, but articles most likely to be published are generally 2,000-3,000 words or about 10 double-spaced pages, each page having a 1-inch border on all sides. However, do not be constrained by length requirements; tell your story in the most direct way, regardless of length. Do not submit articles in a layout format, nor should articles include any footnotes, endnotes, or references. *Be sure to define all acronyms.*

Photos and Illustrations

Articles may include figures, charts, and photographs. They must, however, be in a separate file from the article. Photos must be black and white or color. *Program Manager* does not guarantee the return of photographs. Include brief, numbered captions keyed to the photographs. Place a corresponding number on the lower left corner, reverse side of the pho-

tographs. Also, be sure to include the *source* of the photograph. *Program Manager* publishes no photos from outside the Department of Defense without express permission. Photocopies of photographs are not acceptable.

With the increase in digital media capabilities, authors can now provide digital files of photos/illustrations. These files should be placed on our server via FTP (File Transfer Protocol). (Our author guidelines at <http://www.dau.mil/pubs/pm/articles.asp> contain complete instructions on transferring these files.) Note that they must meet the following publication standards set for *Program Manager*: color and greyscale (if possible); EPS files generated from Illustrator (preferred) or Corel Draw (if in another format, provide program format as well as EPS file); TIFF files with a resolution of 300 pixels per inch; or other files in original program format (i.e., Powerpoint).

Biographical Sketch

Include a short biographical sketch of the author(s)—about 25 words—including current position and educational background.

Clearance

All articles written by authors employed by or on contract with the U.S. Government must be cleared by the author's public affairs or security office prior to submission. In addition, each author must certify that the article is a "Work of the U.S. Government." This form is found at the end of the PM Author Guidance. Click on "Copyright Forms" and print the last page only, sign, and submit with the article. Since all articles appearing in *Program Manager* are in the public domain and posted to the DAU Web site, no copyrighted articles will be accepted. This is in keeping with DAU's policy of widest dissemination of its published products.

Submission Dates

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

Submission Procedures

Articles (in MS Word) may be submitted via e-mail to collie.Johnson@dau.mil or via U.S. mail to: DAU PRESS, ATTN C. JOHNSON, 9820 BELVOIR RD, SUITE 3, FORT BELVOIR VA 22060-5565. For photos/illustrations accompanying your article, send us the original photos or follow the guidance under "Photos and Illustrations"—opposite column. All submissions must include the author's name, mailing address, office phone number (DSN and commercial), and fax number.



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