ARMY AL&T

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Personnel Transformation

Also In This Issue:

- SHORAD Lessons Learned
- PM, THAAD Case Study
- ACE Program Board Process

FROM THE ARMY ACQUISITION EXECUTIVE

Transforming Army Personnel For The 21st Century

The Army has a non-negotiable contract with the American people to fight and win our Nation's wars—decisively. Our ability to do so, the Army's readiness, is linked directly to the well-being of its people—soldiers, civilians, and their families. That is why revamping our personnel infrastructure is an important part of the Army's enormous task of transforming to the Objective Force.

This issue of *Army AL&T* magazine examines several transformation initiatives underway within the personnel community including manning the Objective Force, man-machine interface, and the Army well-being initiative. We also learn more about the workings of the Army Personnel Transformation Task Force.

Clearly, our greatest strength is our people, and the soldier is at the center. In fact, the events following September 11, 2001, reinforced this. That is why recruiting, training, retaining, equipping, and providing for the soldier are paramount. GEN Creighton Abrams, who reconstructed the Army after the ravages of Vietnam, said it best: "The Army is not made of people, the Army is people. By people I do not mean personnel . . . I mean living, breathing, serving human beings. They have needs and interests and desires. They have spirit and will, strengths and abilities. They have weaknesses and faults; and they have means. They are the heart of our preparedness . . . and this preparedness—as a nation and as an Army—depends upon the spirit of our soldiers. It is the spirit that gives the Army . . . life. Without it we cannot succeed."

Today, America's soldiers are protecting our interests around the globe—from fighting in Afghanistan; to securing detainees in Cuba; to training counterterrorism forces in the Philippines, Yemen, and the former Soviet Republic of Georgia. Concurrently, our soldiers are continuing to deter potential adversaries in Southwest Asia and Korea while upholding U.S. security commitments in Bosnia, Kosovo, Macedonia, Sinai, and elsewhere.

More than 182,000 of our brave men and women are forward-stationed or deployed in 120 countries—on point for our Nation, protecting and promoting American interests.

The soldier is the Army's ultimate weapon, the crucial and integral component of the successful employment of all Army systems. During the Cold War, Army doctrine defined three distinct types of forces—heavy, light, and Special Forces. As we build the Objective Force, we have the opportunity to combine what is best from each of these.

From the heavy force, we have soldiers who know how to combine speed, overwhelming firepower, and combined arms operations to dominate opponents. From the light force, we have highly versatile soldiers who bring a rapid deployment mentality—rucks packed and ready to deploy worldwide on a few hours notice. From the Special Operations community, we have close combat specialists who are the best in the world at urban and night operations.

We have the greatest fighting force on Earth. We have the very best soldiers and they have the finest leaders. Our soldiers have world-class equipment, and they handle it with great ease because of their excellent training. We must work hard and work together to keep it that way.

In testimony to Congress earlier this year, Secretary of Defense Donald Rumsfeld said, "If we are to win the war on terror, and prepare for the wars of tomorrow, we must take care of the Department's greatest asset: our men and women in uniform. 'Smart weapons' are worthless to us unless they are in the hands of smart soldiers, sailors, airmen and Marines."

The Army family has changed during the last decade. Military and civilian personnel are more senior, more educated, and more diverse. More spouses work. Our transformation of personnel policies and programs must address these changing demographics and the expectations of a 21st century force. It is a tough challenge, but one in which the Army is leading the way.

Claude M. Bolton Jr.

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COVER

Personnel transformation will radically change the way personnel work is done by focusing on the capabilities and flexibility needed to manage the future Army force.

PERSONNEL TRANSFORMATION: NOT A QUESTION OF WHETHER . . . BUT HOW SOON!

LTG John M. Le Moyne and LTC Franklin Childress

"The current plan is . . . we'll be waiting on the objective for the Objective Force to arrive."

LTG John M. Le Moyne
Army's Deputy Chief of Staff, G-1

Introduction

Transformation is the highest priority in the Army today, eclipsed only by the war on terrorism. Personnel transformation, which is the G-1's contribution, is already impacting virtually everyone in the Army. Initiatives are already in place allowing soldiers to use the Web to verify personal data prior to promotion boards, submit assignment preferences, and streamline database management. Army personnel transformation is a huge success based on Web usage numbers and initial feedback. In addition, a once large and vocal population of transformation naysayers is now very quiet or very few in number. Army Chief of Staff (CSA) GEN Eric K. Shinseki's transformation decisions seem prophetic in the wake of the September 11, 2001, attacks and only serve to reinforce the Army's new mobile strategic requirements.

The CSA's vision cites three priorities: people, readiness, and transformation. He constantly reminds us that people are the centerpiece and that all other actions are in support of people, our most critical resource.

The CSA manages these competing priorities in his transformation effort while meeting his non-negotiable contract with the president and the American people—" . . . to fight and win our Nation's wars . . . with additional requirements to be dominant at every point on the spectrum of conflict and to see first, understand first, act first, and finish decisively."

The Army's basic and most fundamental enablers are its people—they are the centerpiece of the Army and its link to the Nation. A force comprised of people from all components, in the right grades with the

A force comprised of people from all components, in the right grades with the right skills, with world-class well-being programs, is the foundation of our ready Army.

right skills, with world-class well-being programs, is the foundation of our ready Army. How we acquire, train, develop, distribute, evaluate, promote, sustain, and transition our people represents the human dimension of our transformation. The Army's ability to meet its readiness goals hinges on its ability to execute all these tasks in a streamlined, efficient manner while simultaneously reducing the forward-based footprint. To comply with our contract and lead the Army through its transformation, we *must* execute personnel transformation.

The Need For Transformation

The old adage "strength through adversity" best describes the atmosphere within the Office of the Deputy Chief of Staff, G-1, in the 7 months since the tragic terrorist attack on the Pentagon. The events of September 11, 2001, and now Operation Enduring Freedom have served to dramatically reinforce the need to transform our personnel functions by validating needs and shortfalls from commanders in the field. Although much work remains to be done, we are confident that we have validated the current personnel transformation course of action that will completely change the way we view and execute our personnel systems.

The Operational Gap

Our current support to the soldier is not strategically, operationally, or tactically responsive. We are unable to adequately track Active or Reserve component personnel during mobilization or in a theater of war. As a result of our current disjointed, "stovepiped" systems, we run the risk of making strategic, operational, and tactical decisions based on inaccurate and incomplete personnel information. Our current systems are incapable of providing personnel information by battlefield location or tracking Active and

Reserve component status changes in a timely manner.

We also lack a single, comprehensive, authoritative personnel database, instead relying on five separate databases that do not cross talk. We are weighted down with inconsistent, redundant, and complicated data processes that update only stovepiped layers of individual databases. Our current personnel system requires manpower-intensive data input and error reconciliation to alleviate inconsistent updates across multiple databases. The possibility of human error increases with each manual input of data. We also lack an adequate communications and information infrastructure across all components to provide personnel systems that can keep up with our current tactical speed on the battlefield. Commanders' needs for personnel information far exceed our current systems' capabilities.

G-1 Mission, Vision, And Objectives

The Army vision is about people, readiness, and transformation, with a clear focus on the end state—the Objective Force. Personnel transformation is about having the tools, programs, policies, and systems necessary to ensure manning, personnel

readiness, and well-being for the Legacy, Interim, and Objective Forces. The objectives of personnel transformation are to enable Army transformation, increase strategic responsiveness, enhance reachback, and ensure personnel combat power. Personnel transformation is a critical enabler to the success of Army transformation.

To understand the transformation road ahead requires an understanding and endorsement of the Army G-1's mission, vision, and objectives. The Army G-1 is the single human resources provider for all Army officers, enlisted personnel, DA civilians, and contractors. As such, the G-1 is responsible for making available to the entire force the full spectrum of integrated and unified human resource programs, policies, and systems. The G-1 executes this mission through a vision focused on manning the Objective Force and providing world-class well-being programs.

From the G-1's vision, we developed a restated personnel transformation mission—to transform Army human resources programs, policies, and information technology systems to enable the manning, personnel readiness, and well-being of the force. This restated personnel

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transformation mission and focus will guide the development of systems that will ensure a force that is strategically responsive at every point on the spectrum of operations focused on maximizing readiness of the warfighter. The bottom line is that personnel transformation is a "strategic enabler" of Army transformation and essential to our Army's core competency of fighting and winning America's wars.

From the personnel transformation mission, we derive a vision of a strategic end state that consists of three parts: an almost paperless internal personnel environment where information, applications, and communications technology vastly increase the personnel community's productivity and customer service; an external personnel environment where soldiers and staff at all levels can readily access complete, accurate, personnel data and employ the latest analytical tools to support decisionmaking appropriate to their level of clearance; and a cohesive personnel force structure and infrastructure where people, systems, hardware, data, and models are seamlessly integrated to enable maximum network capabilities.

Phased Implementation

We must advance personnel transformation in the same context as Army transformation. Our Legacy Force is the current amalgamation of 5 unique databases that do not cross talk; 320 legacy systems; 1,170 separate processes (of which many are never queried); and more than 1,600 data elements to describe one soldier. In today's connected society, this is completely unacceptable. Our near-term objective is to migrate from the Legacy Force to the Interim Force in all areas as quickly, yet judiciously, as possible.

Our transition to an Interim Force is characterized by the transition to the Defense Integrated Military Human Resources System (DIMHRS) beginning in February 2004, where the Army is the lead for the DOD transition. DIMHRS, combined with the development and proliferation of Web-based applications, will enable the Army to transition to and implement Web-based, redesigned, best-business practices.

Our vision for the Objective Force (2015 and beyond) is being updated daily with the vast changes in information technology capabilities. We envision implementation of enhanced passive reporting and processing capabilities, use of voice-recognition technologies, and the imbedding of essential human resources functionality in Future Combat Systems. Our battlefield footprint should transition to a "thumbprint" as a result of these enablers and our focus of reducing workload in the battlespace.

The Road Ahead

Personnel transformation has focused on five specific areas in the Army human resources realm to support Army transformation: the personnel transformation initiative, introduced in August 2000; the manning the Objective Force initiative, which will shape and train the force for transformation to the Objective Force; the MANPRINT (manpower and personnel integration) initiative, which analyzes man-machine interface, will ensure the Army does not procure weapons and equipment that exceed the Army's ability to provide operators; the Army development system initiative, which will overhaul the officer, warrant officer, enlisted, and civilian management systems; and the Army well-being initiative, which will help balance the work life of soldiers and their families to improve morale, readiness, and retention.

To spearhead this personnel transformation initiative, we have established an integration team headed by MG B. Sue Dueitt, Assistant Army Deputy Chief of Staff, G-1, and Director of the Army Personnel Transformation Task Force. Dueitt has been charged with managing the team's daily interactions with the field to gather critical input and requirements necessary for inclusion in the final system.

The articles in this issue of *Army AL&T* explain more fully these five areas of Army human resources and how they support our goal of transforming the Army's personnel systems. These indeed are interesting and exciting times to be in the Army and to be a part of transforming our personnel systems to support the Army's transformation. The need for these changes is even more urgent as a result of the current war on terrorism. We are on the right path toward achieving our goal, but we need each and every soldier and leader in the Army to work alongside us to make the vision a reality. People are the centerpiece of our formations, and people will make this personnel transformation a success.

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PERSONNEL TRANSFORMATION: THE JOURNEY CONTINUES

MG B. Sue Dueitt

Introduction

"If you don't know where you need to go, then any road will get you there" is a wise, old adage. The Army G-1's intent is that when the rest of the Army reaches the objective state of transformation in 2010, the personnel community will already be there transformed and ready for them. Therefore, the Army Personnel Transformation Task Force has laid down the conceptual framework to serve as an intellectual road map for human resources transformation. This framework supports the Army vision of "People, Readiness, and Transformation" by providing a relevant, reliable, reachable multicomponent human resources system with streamlined business processes, Web technology, and a realigned workforce.

Transformation: What It's Not

Army personnel transformation is *not* just the acquisition of a new automation system. Instead, it will convert outdated personnel processes and the myriad of "stovepiped" personnel systems developed during the Cold War into a coherent, single human resource system to provide real-time, relevant information. Some soldiers are already experiencing personnel transformation when they log onto their Army Knowledge Online (AKO) account from anywhere in the world and pull up their official military personnel file. When they find documents missing, they can digitally scan and electronically transmit them rather than hand carry or mail them into the Enlisted Records Center. This kind of self-service, direct-digital interface with personnel headquarters means soldiers don't have to lose valuable job productivity with a time-consuming trip to their unit's personnel service battalion during duty hours. Saving time and enhancing Army productivity are a big part of what Army transformation is about.

Army personnel transformation is *not* the same as the Defense Integrated Military Human Resources System (DIMHRS). DOD is congressionally mandated and resourced to develop and implement DIMHRS across all our military Services. Although DIMHRS is an exciting and important part of our transformation plan, it does not cover all the personnel capabilities needed by the Army's Objective Force. In FY04, the Army will be the first Service to begin fielding DIMHRS, which will use a commercial off-the-shelf software package called PeopleSoft 8 to transform numerous personnel functions and integrate pay functions. Army DIMHRS implementation will move us along our journey toward realizing our goal of providing modern, world-class, Web-based, paperless personnel operations across all Army components—Active, National Guard, and Reserve.

Army personnel transformation is *not* about simply automating existing personnel and pay processes or making small incremental improvements. It is not total quality management or continuous process improvement. Instead, personnel transformation seeks to radically change the way we do personnel work by adopting not only today's best business practices and Web technology, but also by focusing on the capabilities and flexibility needed to manage the Army force in an uncertain world.

Life-Cycle Functions

Army personnel processes are organized around the eight personnel life-cycle functions. These life-cycle functions are the core of what the personnel community provides. The need for these functions will not go away, but how we perform them will dramatically change.

• *Structure.* Balance force requirements with distributable personnel inventory.

• *Acquire.* Recruit and retain by grade and skill requirement against the current and planned force.

• *Distribute.* Assign personnel against mission priorities in an equitable manner while considering soldier preferences and need for training.

• *Develop.* Forecast training loads across components, and balance career development with readiness.

• *Deploy.* Mobilize, track and demobilize, and task-organize quickly across components.

• *Compensate.* Execute pay, benefits, and allowances.

• *Sustain.* Process awards, evaluations, and routine personnel actions.

• *Transition.* Move soldiers between National guard, Reserve, and Active duty until retirement; execute retiree recall.

Inherent in these functions is the need to focus on the critical personnel processes that ensure combat readiness, such as strength account, casualty management, and replacement operations.

To provide the capabilities needed for our future Army, such as the ability to "reach back" from the battlespace to our supporting locations, we must radically re-engineer how the eight life-cycle functional processes perform. (A process can be thought of as activities designed to produce a specified output, such as the evaluation process produces Officer and Enlisted Evaluation Reports.) For example, the

evaluation process redesign might consist of using "voice-to-text" technology to electronically transmit dictated evaluation information to a reachback facility, where the computer translates, prepares, and routes the report for review and approval via e-mail within a matter of minutes. Clearly, Army personnel transformation is about innovation and major changes to provide future human resource capabilities to man the Army's Objective Force.

Three Major Pillars

Most transformation efforts seem to focus on three elements, or pillars, and personnel transformation is no exception. The three pillars are:

• Re-engineering of functional processes and policies to achieve needed capabilities,
• Leveraging of new technology to improve functionalities, and
• Realignment of the organization structure and workforce.

Army personnel transformation seeks to define the capabilities needed to support an adaptive, future Army workforce that is evolving. First, those personnel capabilities must be achieved through redesign and streamlining of Army human resource policies and processes. Many of the personnel policies and processes will be imbedded in the computer software applications.

Second, personnel transformation will exploit technology like wireless and digital communications, the World Wide Web, and a centralized personnel database for all components. This technology will improve the speed, accuracy, and accessibility of personnel systems. But of paramount importance is the centralized personnel data against which all personnel functional applications will run. One database means soldier records will no longer be "lost" when soldiers transfer back and forth from Active component to the National Guard or Reserve.

Third, the size, shape, and skills of the personnel community must change to better use our civilians and contract support personnel, along with leveraging new technologies and capabilities. The military and civilian workforce will have fewer low-level data entry personnel and more customer service representatives.

Future Organizations

Personnel units in the future must be able to respond across the full spectrum of operations. We must have the flexibility to modularize and tailor the force in accordance with the needs of deployed units. The Army's Interim and Objective Forces will require a responsible personnel distribution system to task-organize "on the fly." It is well recognized that when future demands are unpredictable, an organization may need to expand or contract in response to mission requirements, and yet still be able to rapidly assemble the right personnel to deal with an evolving mission.

Modular personnel organizations have a standard way of linking selected professional staff, reconfigurable process modules, "hunks" of codified knowledge, and common computer-system protocols. When a deployment requires a modular personnel cell forward, the personnel unit can respond flexibly by deploying a customized cell to feed transactions to the reachback facility. Just like LEGO modules are snapped together, cells of personnel units might likewise be put together according to established rules.

Future Capabilities

The Army personnel community of 2010 could become a collection of assets, managed as a purposeful, adaptive organization that provides an array of capabilities. Joint and Army planning guidance stresses capabilities rather than requirements. Because it is impossible to predict the future, we must get better at reacting more quickly with flexible capabilities. Below is a list of capabilities to guide Army personnel transformation:

• *Reachback.* Conduct personnel and pay operations outside the battlespace, thus reducing footprint.

• *Universal Access to Self-Service.* Ensure all soldiers and employees have access to computers and AKO for reviewing and updating their personnel and pay records.

• *Intelligent Human Resource Software Applications.* Embed "smart" links in the software to aid users. For instance, if a soldier inputs a name change because of marriage, the intelligent software will show pop-up screens with reminders and links for also changing emergency contacts, insurance beneficiaries, will updates, tax withholding information, etc.

• *Unobtrusive Records and Knowledge Management.* Devise methods to automatically capture and store unit records, plans, and other documents. When an employee begins to type an operations order, a help icon will automatically offer sample documents.

• *Behavior Analysis and Correlation.* Use online entrance and exit interviews to track and analyze employee behavior. Analyze correlations between soldier behavior versus tour lengths, compensation, military occupational specialty, promotion, etc., to make better personnel policy judgments in these areas.

Conclusion

The Army personnel transformation journey is like that of the American pioneers who moved west in wagon trains. Just as those pioneers were unable to specifically identify their homestead locations in advance, we also are unable to specifically identify all of our transformation outcomes at this time. But just like the pioneers, we have no doubt that the direction we are headed is the right one.

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Introduction

In the Army vision, the Army Chief of Staff GEN Eric K. Shinseki states, "The magnificence of our moments as an Army will continue to be delivered by our people." People are the Army's greatest asset and the heart and soul of its readiness. As the Army transforms, its commitment to take care of the force (soldiers, veterans, retirees, civilians, and their families) remains. As such, the well-being of the force is a daily pursuit for all commanders, who rely on human resource (HR) assets for support. Personnel transformation, like the Army transformation, will be executed by the HR community. As such, there is a need for significant change in our Doctrine, Training, Leader Development, Organization, Materiel and Soldiers (DTLOMS).

Background

To meet the Army vision, the entire HR community (the Army G-1, the U.S. Total Army Personnel Command, the Adjutant General School, and personnel organizations Armywide) established the personnel transformation.

The HR community initially sought to use a single corporate database, redesign aging processes, and revise various structures to perform HR functions in support of the force. We knew our core mission would not change. The Army would continue to require trained professionals focused on HR functions because commanders cannot do this alone. What would change are the "how" and "where" the functions are performed. Vital to this transformation are the tools used for HR work. The intent was a simple, accessible, accurate, reliable, relevant, and timely HR system of assets to provide services in the right place and at the right time.

Concept Of Support

The role of the HR community is to man and help sustain the force. The HR community deals with people distribution requirements and conduct of casualty and replacement operations; providing personnel and postal services; and coordinating morale, welfare, and recreation services to help sustain combat readiness. How and where we sustain must be transformed. For the transforming Army, HR support focuses on complementing the underlying principles of the Objective Force: responsive, deployable, agile, versatile, lethal, survivable, and sustainable.

To achieve this, HR efforts focus primarily on two issues: system and structure. The Defense Integrated Military Human Resources System (DIMHRS) is a system-of-systems solution. DIMHRS is a database with Web-based applications for viewing, inputting, and managing personnel data. With a link to the Web, we can access data anytime, anywhere. When we fully field DIMHRS, our structure will center on unit of action (UA) S-1 and unit of employment (UE) G-1 sections as the HR operators of the Army. The proposed concept under review today phases out command and control personnel units (personnel groups and battalions) and replaces them with personnel management centers (PMCs) that will oversee more than 1,000 personnel tasks. PMCs, which augment S-1 and G-1 sections, will belong to commanders from battalion through theater and will provide support from the home station or from deployed locations based on the commander's desire. The S-1/G-1/PMC will employ the system, equipment, and people to provide HR support.

DTLOMS Impact

These changes will significantly affect DTLOMS and how the HR community prepares for the future. A discussion of recommended DTLOMS revisions follows.

Doctrine. Doctrine must reflect the increased demands on the human resource system. The bar of quality precision, speed, and accuracy excellence is raised with demands of the Objective Force. As a result, doctrine must reflect the change in "how" we sustain. Readiness, reach, passive reports, and a shift in "where" we support are key aspects.

The Objective Force will work under a new construct of readiness called "train, alert, deploy." This means training before an alert and not after, and being ready to move out almost immediately. The HR community's challenge is to ensure HR support keeps the force ready at all times. Soldier readiness checks cannot take hours or days. HR assets embedded in units give commanders direct access and input to HR data. Soldiers will also have more access and responsibility for their own readiness.

Web-based and wireless technology enable our reach. Reach reduces the number of people who must deploy with the unit to maintain support. With better reach, commanders can tailor support according to their particular mission requirements.

The Army is working to ensure that the Future Combat Systems (FCS) of the Objective Force interfaces with DIMHRS so that key data, such as personnel strength figures, flow through the FCS. The intent is to allow soldiers to log onto DIMHRS via the FCS—in concert with other technology enablers—and update their status without additional human intervention. (FCS will have the technology to manage tasks, such as tracking the fact that certain people are operating or riding the FCS.)

Commanders will rely on their S-1 or G-1 sections and PMCs for HR support, analysis, and advice. Coupled with simple, accessible, and accurate systems and the equipment to run them, these sections could respond to the most demanding support needs from any location.

Training. HR operators will learn to use and manage systems and equipment. DIMHRS, for example, is a major change from the way business is transacted today and will require new training. In addition to personnel functions, DIMHRS includes military pay functions that are not a part of the current personnel system. Not only do HR operators need training on DIMHRS, but also every soldier and leader must have basic DIMHRS skills as well as an understanding of the combat power leverage the systems can provide to commanders.

The military occupational specialty (MOS) structure will change as will the training for those who already hold an MOS. MOSs in many specialties are merging. The same is true for the Adjutant General MOS. They will merge to reflect one system and meet the Army's desire for multiskilled soldiers. This affects the TTHS (trainee, transient, holdee, and student) accounts as course lengths change and the volume of soldiers to train increases. However, training of all new recruits and current soldiers will be challenged in the schoolhouse. One way to deal with this is through distance learning (DL). This technique relies on more technology as well as smart and efficient teaching techniques. DL also lets HR operators in the field sustain their training. Because HR assets will be unit assets, training must address both the concerns of the command as well as the functionals.

Leader Development. Training must focus on "how to think" versus "what you think." This training gives HR operators and leaders skills beyond mere equipment and automation usage. Leaders must have sound tactical and technical skills and know how to analyze, think, and act proactively. They must possess a warrior ethos that guides their thinking and professional advice. This way, they apply their HR skills in a way that meets functional and unit needs.

HR officers and noncommissioned officers (NCOs) must be similarly suited and skilled at all levels from battalion to HQDA. They are the HR experts for the commander as well as mentors to subordinates within the "HR chain." A G-1 should have the background and skills to help his brigade S-1s while the brigade S-1 in turn would do the same for the battalion S-1.

NCOs and warrant officers will naturally rise from the enlisted ranks within the structure. The process will differ for officers. Adjutant General officers will continue to provide the core of HR leadership, and most will start in branch detail assignments. Other officers will migrate to HR work through redesignation. Either way, an important requirement will involve developing them early in jobs such as battalion S-1.

Organization. The focal point will include fully manned and trained S-1 and G-1 sections and PMCs. Personnel units will be phased out to assign HR experts at every command level. Not only will the S-1 and G-1 sections and PMCs be the focus of support, they will also become the central place to train soldiers and grow HR leaders.

These changes will achieve the Army's need for a reduced footprint in the battlespace through improved connectivity and reach techniques. With the correct enablers such as Web-based technology, connectivity, digitized records access, passive accountability, and embedded capabilities in FCS, the HR community can reduce presence and increase support and analysis capability.

Materiel. Materiel needs require current or emerging technologies that we do not yet use. HR support enablers must be embedded in or interface with the FCS. The following are some examples of required capabilities for the Objective Force:

• Passive capability for continuous, real-time reports of manning and casualty data;
• Voice-to-text features to report "variable" casualty data;
• A common view of manning and operations from UA S-1 and UE G-1 to Army G-1;
• In-transit view of replacement movement;
• Exchange of critical HR data between combat service support functional processes; and
• Tools to mesh course of action and loss projection with operational plans and orders.

The Army is currently developing the following capabilities as key enablers to remain in the FCS:

• Personnel module of the Combat Service Support Control System,
• Weapons platform crew registration and personnel situation reports of Force XXI Battle Command Brigade and Below, and
• Management module - data exchange of Global Combat Support System-Army.

Soldiers. As simple and reliable as we need our equipment and system to be, HR support depends on trained and skilled soldiers. Soldiers with the right HR training and skills are invaluable assets to the commander and the Army in general. They must be ready to operate anywhere, anytime, and may require self-reliance for long periods. They will have to act quickly and handle much data with keen skill in little time. Although they train for war, they serve daily to help keep soldiers ready. They are the future HR leaders.

Conclusion

For 226 years, the human dimension of soldiering has been a crucial ingredient for Army readiness. HR support, specifically, will remain crucial during the 21st century as the Army undergoes a personnel transformation that will be more than just a change in how the HR community does business. Personnel transformation will change the way the Army does business, and will be a major paradigm shift—a cultural revolution involving the entire force.

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A Call To Arms . . .

INTEGRATING PERSONNEL AND PAY SYSTEMS IN THE 21ST CENTURY ARMY

Paula Davis

Introduction

More than a rollout of new software and the creation of a common database, the Defense Integrated Military Human Resources System (DIMHRS), which is less than 2 years away, will revolutionize the way the Army conducts business.

The Army will be the first military Service to implement DOD's single, integrated, Web-based military personnel and pay system. The system will provide everyone in the Army with personnel and pay management tools that are more responsive and efficient. The target date for the DIMHRS initial operating capability is the third quarter of 2004.

The World Wide Web has changed the way we shop, conduct research, and talk to one another. Capturing the power of the Web for our new military personnel and pay system will enable us to do things in the Army that few thought possible. Modernizing the Army with a technologically advanced system such as DIMHRS will mean that soldiers and commanders can be free to do the business of soldiering. With DIMHRS, Service members can feel confident that their personnel and finance information is correct and that their families are supported. However, successful implementation will require a great deal of work and coordination among the Army, Army National Guard, and Army Reserve, as well as all components of the Navy, Marine Corps, and Air Force.

There are many in the Army who remember how the introduction of personal computers changed the world. However, it wasn't until we networked those individual systems that we began to see how technology could really transform our lives. DIMHRS will bring the same dramatic changes to the Army and DOD. Through standardization of data and system interoperability, warfighting commanders will be able to "see" all of their joint assets—Active, National Guard, and Reserve. Commanders will have better personnel planning tools, and soldiers will be able to access their files from anywhere, at anytime, via the Web.

Software

The promise of DIMHRS is to implement new technologies that will transform and streamline the Army's personnel and pay systems. The greatest challenge to implementation is managing the necessary change within the Army. In the past, we built new systems that fit our current business rules and processes. With DIMHRS' choice of a pure Internet commercial off-the-shelf (COTS) software product, PeopleSoft 8, we will have a system that already works. We just need to make sure it will work for us.

Challenges

For the Army, that challenge is twofold. We must ensure that the DIMHRS functionality can deliver what the Army needs and ensure that the Army community trusts that it will perform every time. The only

Capturing the power of the Web for our new military personnel and pay system will enable us to do things in the Army that few thought possible.

way we can clear those hurdles is to engage the talent of proponent agencies, within all three components, to validate that DIMHRS will deliver the required functionality.

Part of the process will include a shift in the Army's mindset. To adopt a COTS product means changing how the Army thinks about personnel and pay business. Getting the desired result is more important than how business has been done in the past. Using the best practices embedded in the DIMHRS COTS choice, PeopleSoft 8, will help streamline business practices. "There won't be a perfect fit," said COL Kevin Troller, Deputy, Army DIMHRS Office, "but to best capitalize on the benefits of the software, we must adopt business practices, not adapt what we currently do."

DIMHRS will consolidate most of the current legacy system capabilities into one single application that is intuitive and simple to use. The strength of DIMHRS will also transform the human resources community and make it more responsive to the needs of its soldiers and their families.

Desktop access to standard reports and custom query capabilities are additional benefits that DIMHRS provides. Meaningful insights from current, accurate data will support commander decision-making processes at all levels.

Any revolution faces skepticism and a reluctance to change. For DIMHRS to succeed within the given timeframes, members of the Army community must be informed that change is coming. Additionally, soldiers and leaders must understand why change is necessary and, through teamwork, build a commitment for success.

With the selection of PeopleSoft 8 as the commercial software for DIMHRS, we will have a system that is much more efficient and powerful than the hundreds of legacy systems now employed by the four Armed Services. PeopleSoft 8 is an enterprise, Web-based system employed in both private and public organizations. For example, Ford Motor Co.

has implemented PeopleSoft 8, and 97 percent of their functions are self-service via the Web. Additionally, other federal agencies, including the U.S. Coast Guard, have successfully implemented PeopleSoft 8. It works and it works well.

Why should those outside of the personnel and pay community care? Because everything we do as an institutional Army starts with the soldier. We must understand that how we capture and translate facts about soldiers will ultimately affect how we mobilize, outfit, and promote them. The challenge is to make this system work for all DOD military Services.

Changing Processes

We are currently changing from a multitude of duplicative, labor-intensive processes to a system that knows the rules and guides its users. When the Army integrates personnel and pay systems, soldiers will automatically get the pay raise from a promotion and the adjustment to basic allowance for housing when orders are cut for a permanent change of station. Reserve members and their families will benefit from one personnel and pay system that tracks them regardless of their status. In a multi-Service, multicomponent arena, all Service members deserve the seamless support that integrated processes and systems can provide.

The scale of the changes inherent in implementing DIMHRS is hard to overstate. Hundreds of systems currently employed by the Services will be replaced. Data must be "cleansed

We must understand that how we capture and translate facts about soldiers will ultimately affect how we mobilize, outfit, and promote them.

and validated" and then migrated to a common database. Members of all Services must find common ground for personnel and pay actions. An issue-resolution process will address the requirements not fitting into the PeopleSoft 8 functionality. DOD's Joint Requirements and Integration Office is engaged in meeting that challenge.

The Navy is the executive agent for DIMHRS, and the Joint Program Management Office (JPMO) is located in New Orleans, LA. The JPMO will work with a soon-to-be-named developer/implementer contractor whose job will entail further analysis of the PeopleSoft 8, designing and building the system, and deploying DIMHRS in the field. Success will hinge on the knowledge and commitment of subject matter experts and the support of the military leadership.

Conclusion

The establishment of the Army DIMHRS Office and the Army Personnel Transformation Task Force are signs of commitment by the Army's leadership. "A transformed Army must have a human resource system that meets the Army's manning and readiness needs while delivering services necessary for our soldier's well-being," said LTG John M. Le Moyne, the Army's G-1. He added, "DIMHRS will provide the integrated, cross-component, Web-based capabilities that we need to build that system." The Army must commit the necessary resources and talents now to ensure that DIMHRS is successfully implemented on time. It is a call to arms for all of us to deliver on our promise to our soldiers.

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PERSONNEL TRANSFORMATION: THE DYNAMICS OF CHANGE

COL Ruth B. Collins

Introduction

At the March 2001 Personnel Leaders Meeting, Army Chief of Staff GEN Eric K. Shinseki described his vision of Army transformation for the assembled senior leaders. At the conclusion of the address, Shinseki was asked what three things he needed most from the personnel community to support Army transformation. It was an excellent question at the time—one for which there was no real answer, but also one that should be used today to frame some important dynamics of change.

Change Philosophies

Many of us have read or heard the philosophies of Jack Welch, former CEO of General Electric Co. for 20 years. In his book *Jack: Straight from the Gut*, he states, "I've always believed that when the rate of change inside an institution becomes slower than the rate of change outside, the end is in sight." Shinseki has also said to many Army audiences, "If you don't like change, you'll like irrelevance even less."

It is intuitive that transformation involves change, but why do so many want to get credit for transforming without substantially changing? Why is change so hard? In 1513 A.D., political philosopher Machiavelli is believed to have said, "Nothing is more difficult than to introduce a new order because the innovator has, for enemies, all those who have done well under the old conditions and lukewarm defenders in those who may do well under the new."

We can describe many military reactions to change as almost schizophrenic in nature. On the one hand, we can honesty boast that we have changed tremendously throughout our history. You often hear, "Of course we can change; we change all the time; just tell us what you want us to change and we'll do it!" Author Peter Senge says in his book *The Fifth Discipline: The Art and Practice of the Learning Organization*, "In a traditional hierarchial organization, . . . all folks needed was [sic] their 'marching orders.'" On the other hand, we are often quite defensive about change. You hear words to the effect, "Change?

Why change? Change to what? Why change when we aren't sure what the Objective Force will look like or require?"

One reason we've become so defensive about change is that it's normally associated with more work and fewer resources. Many senior leaders invoke change but rarely identify for us what we can stop doing when we incorporate the new good idea. Isn't it true that change is more readily accepted when you can see clearly that work is eliminated, improved, or at least adequately resourced? Transformation is as much about what not to do as what to do. You've heard it said, "To change and to change for the better are two different things." Change needs to ultimately improve the organization, not just make it different.

Leading Change

At the Army War College (AWC), where we educate future senior leaders, we address change management as an important strategic leader competency for the future. Change is as integral to future strategic leadership as is any other single operational or conceptual theme. Yet, we see the same reluctance to change here as elsewhere in the Army. Not surprising, you say, because future senior leaders are simply a product of the environment and culture in which they have thrived. Their separate branches or functional areas emphasize, more or less, the institutional doctrinal and conceptual foundations upon which

their contributions to the overall Army are based. A recent speaker at the AWC described much of the resistance to change in our military Services as the result of building communities with "tribal representatives operating tribal machines that can only be interpreted by tribal representatives."

In the personnel community (and correspondingly in other support communities), should there be resistance to change when we can see so clearly that we are not delivering full-spectrum support to our full-spectrum force? We ask ourselves, "Why haven't we had more innovation in our past? Why do we find ourselves in 2002 with outdated processes and systems and questions about relevance?" No need to dwell on them, but we should use lessons learned in tackling the critical transformation facing us today.

It seems we've previously left "change management" to a relatively small group of people in our community and have been entirely too cautious about technology and innovation. We weren't able to integrate the entire personnel community with processes and systems that worked top to bottom and back again. There are lots of reasons for this—inadequate resources, decentralized approach, etc. We all know the horrific results: hundreds of stand-alone and unintegrated systems with unintended consequences; unreconcilable manning statistics and sources; and systems that poorly support mobilization, deployments, or integration of our vital Reserve components. To our

community's credit, we have put all that ugliness upfront in our personnel transformation campaign and are concentrating on resourcing a vital, achievable, future vision.

Change Dynamics

How do change dynamics of our personnel transformation link to those of Army transformation? This leads to what I believe are good responses to the question asked of Shinseki last year, "What three things do you need most from the personnel community in support of Army transformation?"

• *Be a committed leader of change yourself.* Take a leading role in producing and managing the desired effects of Army and personnel transformation and help communicate the strategies to the rest of the organization. Don't personally take on all the issues, but co-opt and solicit enthusiastic support from those around you. Be guilty of neither nearsightedness nor farsightedness in establishing the immediate and long-term requirements for your part of the personnel community. Don't wander without focus or watch others do the same. Peter Senge, again in his book *The Fifth Discipline: The Art and Practice of the Learning Organization*, reminds us, "Without a pull toward some goal which people truly want to achieve, the forces in support of the status quo can be overwhelming."

• *Go after the latest technology with a passion.* Realize that commercial products offer many solutions in systems, processes, and practices. The selection of PeopleSoft 8 for the Defense Integrated Military Human Resources System is a great start, but we can't sit back and wait 2 to 4 years for that small group of others to plop solutions in front of us without making an investment between now and then. Find technology and process solutions for what you do every day, and enable the bright, technically advanced soldiers, warrant officers, civilians, and contractors to do the same. Transformation is in the ingenuity of our young folks. They are computer savvy and can handle the simultaneous audio, visual, and sensory inputs that many of us cannot.

Guide our young folks; empower and resource them to the greatest extent possible, every day. Fight for implementation of their solutions because you know how truly critical they are to providing battlefield and institutional support to our fighting men and women.

• *Be a confidence agent for soldiers through the change period.* We must anticipate increased anxiety within the force as a result of transformation unknowns. Because of our responsibility to support our soldiers, we have the unique challenge of not only managing our own change, but helping others understand and find confidence in the bigger Army. We are "keepers of the keys" to lifeblood systems that result in pay, reassignments, promotions, services, and the full range of Army programs that touch soldiers, veterans, retirees, families, and others where it counts. They will look to us through the change period for assurances that the Army will still take care of them and their families. Our signals will directly impact manning and retention.

Change Resistance

It's important that we ask ourselves, "Do we now have enough of the right folks at all levels working and 'owning' personnel transformation?" Also, are we perpetuating that the tragic, untimely loss of former Deputy Chief of Staff for Personnel LTG Tim Maude on September 11, 2001, is the effective end of our masterful change opportunity? I hope not, but we should face what might be causing us to hold back from supporting needed changes. Like many of you, I linger on the personnel lost and the opportunities lost when the former DCSPER and his office were hit. But I also know that LTG Maude and all those lost would expect each of us to aggressively fuel their envisioned changes, which the new Army Deputy Chief of Staff, G-1, is so capably leading today.

One last aspect about change resistance, one that runs head-on with what's valued in our culture: When you change from something popular to something unpopular, even when you sense it to be the right thing, it is a significant dynamic. Changing from

something unpopular to something popular is always easier. For us military personnelists, who for these past 8 years tasted the fruits of our command-centric culture, it is extremely difficult to see the uncertain future. This is a dynamic for all organizations, causing emotions to run high and change barriers to be formidable. We should not take this lightly, but continue to explore the future environment and the transformed place in our Army that values excellence in operational, yet functional areas.

Conclusion

Change cannot occur without willing and committed followers. All of us are both leaders and followers in every aspect of personnel transformation. We must set the conditions and resource "strategies within strategies" to make this complex change occur effectively for the good of our community, and more importantly, for our Army. Personnel transformation, like Army transformation, is not a "be all, end all" plan. We have alternatives, vulnerabilities, challenges, and interim successes and failures. By understanding and focusing on the dynamics of change, we can, as the professional and capable team that we are, better execute personnel transformation.

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MANPRINT PERSPECTIVES ON PERSONNEL TRANSFORMATION

Dr. Michael Drillings and Dr. Thomas Killion

Introduction

Tomorrow's battlefield has been described as a complex environment, filled with new equipment and technologies. If our forces are to dominate in this environment, they will do so as a result of more than just having superior equipment. Real battlefield effectiveness is the product of a good match between the people who operate and maintain the equipment and the equipment itself. Army Chief of Staff GEN Eric K. Shinseki recognized this relationship when he wrote that the soldier remains the centerpiece of our formation.

At the heart of the Army vision are well-trained soldiers using state-of-the-art equipment to win wars. The Army's program to ensure that soldier issues are the critical drivers in system design, development, and acquisition is called MANPRINT (manpower and personnel integration; generally known as human systems integration or HSI throughout DOD). The objectives of MANPRINT are as follows:

• Optimize both the quantity and quality of the personnel needed for the system,
• Design training so that it is appropriate for the capabilities of the soldier and the conditions under which the equipment will be operated and maintained, and
• Design systems that are easily used by soldiers, are safe to operate, cause no unnecessary health problems, and maximize soldier survivability.

MANPRINT is the process by which acceptable trade-offs are made among performance, design, and soldier issues. It includes the following seven domains:

• *Manpower.* Number of military and civilian personnel required and potentially available to operate, maintain, sustain, and provide training for systems.
• *Personnel Capabilities.* Required cognitive and physical capabilities of personnel to train, operate, maintain, and sustain materiel and information systems.
• *Training.* Instruction, education, on-the-job training, or unit training required to provide personnel and units with their essential job skills, knowledge, values, and attitudes.
• *Human Factors Engineering.* Integration of cognitive and physical characteristics into system definition, design, development, and evaluation to optimize human-machine performance.
• *System Safety.* Design and operating characteristics of a system that minimize the human or machine errors or failures that cause accidents.
• *Health Hazards.* Design and operating characteristics of a system that create significant risks of bodily injury or death; threats include loud noise, chemical and biological substances, extreme temperatures, and radiation energy.
• *Soldier Survivability.* Characteristics of a system that can reduce fratricide, detectability, and probability of attack, as well as minimize system damage, personal injury, and cognitive and physical fatigue.

The MANPRINT process addresses trade-offs within and among these domains. For example, what are the implications within and across the domains of personnel capabilities, human factors engineering, and training with regard to increasing or decreasing the knowledge and skill demands associated with a particular operator or maintenance position? Optimizing the system from the perspective of a single domain is insufficient; one must consider the interactions and trade-offs among all of the domains. For example, in considering the design of a system interface involving high information rates and substantial complexity, one could take several approaches:

• Limit operators to soldiers having above-average knowledge, skills, and abilities;

• Develop and implement specialized training programs that support a wide range of soldiers;

• Use intelligent agents and other software processing techniques to place a greater burden on the system and reduce the workload of the soldier;

• Use some combination of the above.

The approach adopted would be based on trade-offs involving personnel availability, technical feasibility and complexity, development costs, operations and maintenance costs, maintenance implications, and other factors. The application of MANPRINT techniques not only results in more usable systems, but also improves the operational effectiveness of systems.

Strategic Value

The Army developed the MANPRINT process to promote the consideration of soldier issues at every stage of the system acquisition process. MANPRINT has been shown to be effective in improving system performance and in reducing overall life-cycle costs. For example, an analysis of MANPRINT issues in the development of the Comanche helicopter found that the application of MANPRINT would result in a projected cost avoidance of $3.29 billion over the life cycle of the Comanche fleet. The savings will be the result of major design influences in most of the Comanche's systems. For instance, the design of the Comanche is optimized for easy maintenance. A portable, intelligent maintenance aid contributes to speedy fault identification and reduction in the rate of unnecessary parts replacement. Accessibility has been eased for most major components, and the engine maintenance tool set was reduced

from the typical 100-plus tools to only 6. These design features and others reduce the number of maintenance personnel, reduce the cost of maintenance and parts, and greatly improve system availability, while also reducing the number of units required to accomplish missions. The Comanche Program was particularly significant in that MANPRINT principles were incorporated from the beginning, with MANPRINT issues receiving significant weight in the source selection process.

Task/Functional Analyses

The MANPRINT process employs task and functional analyses and modeling to optimize soldier efficiency in operating and maintaining systems. These analyses, matched with the relevant personnel attributes and well-planned training, can reduce the manpower requirements for a system or system-of-systems. Minimizing soldier risks in terms of health hazards, safety, and soldier survivability decreases the potential for unnecessary casualties, thus increasing readiness rates and reducing the total system manpower requirements.

Because early design decisions are so critical to life-cycle costs, MANPRINT must be employed early in a system's development cycle to maximize out-year operations and support savings. Failure to apply MANPRINT concepts to design can result in systems with inadequate performance, excessive manpower and personnel requirements, and significant health threats. (See "Why MANPRINT Makes Sense for Streamlined Acquisition," J. Hiller and T. Killion, *Army RD&A*, November-December 1995, Page 20.)

The heart of the MANPRINT process is its outreach to program managers and contractors. With the necessary education and appropriate tools and methods, program managers better understand the MANPRINT process and how it

How Many Tools Does It Take To Maintain A Turbine Engine?

Without MANPRINT 134 Different Tools

With MANPRINT 6 Tools

Which would You Prefer?

contributes to reduced life-cycle costs, optimizes total system performance, and enables warfighters to win on the battlefield.

Army Transformation

The Army's transformation to the Objective Force is characterized by both materiel and personnel changes. New materiel systems, such as Future Combat Systems, must not only meet performance requirements, but must also meet standards of personnel affordability. If the future Army is characterized by systems that need too many operators and maintainers, with too highly specialized skills, where the training is too long and expensive, the Army will have failed in its transformation. It is the role of the MANPRINT Program to address such concerns throughout the design process.

The Army transformation's use of new, advanced technologies will require soldiers with new skills. The accelerated transformation schedule requires that tentative design decisions, made early in the acquisition cycle, be quickly and effectively evaluated by the MANPRINT community. Inadequate design decisions, made early in the acquisition cycle, can be compensated for later, such as through product improvements, but usually with significantly adverse consequences for the life-cycle costs of the system. Experience has shown that decisions made early in the life cycle of a system largely determine total life-cycle costs. To improve those decisions, project managers must be continually kept up-to-date on new information about MANPRINT and how they can be assured that their systems are compliant with MANPRINT guidance.

Personnel Transformation

To achieve the ambitious goals of the Objective Force, our personnel systems are also undergoing trans-formation. The Army Deputy Chief of Staff, G-1, has initiated an effort to phase out "stovepiped," burdensome personnel management and support systems and replace them with an integrated, commercially based, multifunctional system. MANPRINT can and will play a role in these developments in two ways. First, just as it is applied to weapon systems, the MANPRINT process must be applied to information systems. The goal is to make such systems more usable, both for the operators and maintainers and for the customers (i.e., leaders and soldiers). Minimizing the personnel burden associated with operating and maintaining this integrated system can result in significant life-cycle resource savings. Providing more comprehensive, integrated information to decisionmakers will result in more effective and efficient personnel management. In addition, providing an interface to the soldier that is easy to understand and use and that requires minimum training, decreases access time, and increases quality of life. This is accomplished through faster access to critical information, more rapid resolution of problems, reduced frustration, etc.

Second, application of MANPRINT to the design of Objective Force systems will enable the Army to more effectively manage the personnel requirements associated with those systems. Informed design should allow us to develop systems that are optimized for future soldiers with regard to demographic characteristics, the knowledge and skills they bring to the situation, the training systems available, and so on. Synergistically, improved personnel management and effective system design will facilitate the realization of an Objective Force that has both the materiel and personnel to achieve dominance on the future battlefield.

Summary

MANPRINT puts the soldier at the center of the design process—equipping the soldier rather than manning the equipment. As the Army undergoes transformation to the Objective Force, it is as important as ever to apply thoughtful MANPRINT processes to the design of our future systems. This includes not only weapon systems, but also personnel management and support systems. MANPRINT, therefore, has a dual role in personnel transformation: minimizing the burden on future personnel through informed weapon system design, and aiding in the creation of personnel information systems with low overhead that effectively support both leaders and soldiers.

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SELECTION AND ASSESSMENT SYSTEMS TO SUPPORT PERSONNEL TRANSFORMATION

Dr. Michael G. Rumsey

Introduction

The concept of Army transformation moves us beyond the idea of incremental change. Army transformation recognizes emerging and projected changes in the strategic, technological, and social environment, and generates doctrinal, organizational, and functional concepts to ensure that the Army can meet the new challenges associated with these changes. The role of soldiers in this transformation is stated plainly in the Army vision (2002): "The Army is people. Soldiers … are the centerpiece of our formation."

The Army must manage its complex personnel needs and personnel support systems with the most effective and efficient automated tools available. Just as Army transformation must move beyond incremental change to meet the changed environment in which the Army is expected to operate, so too must personnel transformation move beyond incremental change to the existing personnel systems, policies, and procedures if these are to meet the requirements of the Objective Force. Current systems are barely sufficient in complexity, sophistication, and integration to meet existing needs and will require a major overhaul to meet the needs of an information-intensive future Army.

While the architecture of future human resource information systems is critical, the information that is fed into this architecture is equally critical. The success of personnel transformation can be gauged by whether the systems put capable and motivated soldiers in place to perform the functions of the Objective Force. This article discusses information elements that support the identification and placement of such soldiers. These information elements will be used to match applicants to organizational needs. They support, first, the selection decision—determining who is qualified to serve in the Army. Next comes the classification decision—how are soldiers best matched to jobs to achieve maximum organizational benefit? Then, the promotion decision—who is best suited to advance to the next higher organizational level?

Selection And Classification

Each of these decisions is based on judgments about what personal attributes are most critical to successful performance for the position in question. At the beginning of the personnel selection process, the principal selection determinant is the combined score from the cognitive aptitude test battery, the Armed Services Vocational Aptitude Battery (ASVAB). Also taken into account is whether the individual is a high school graduate.

Even before the Army transformation vision had taken hold, the potential benefits of expanding on these tools for enlisted selection purposes was considered. In the 1980s and 1990s, the U.S. Army Research Institute for the Behavioral and Social Sciences examined a variety of spatial, psychomotor, and motivational measures as candidates to augment the ASVAB. The results led to the administration of a new spatial test in the ASVAB and the use of a motivational instrument as a screening tool in an ongoing experimental program to expand the recruiting market known as GED (General Educational Development) Plus.

Future Selection And Classification

Now our focus is on the future. We are examining how changes in the international environment and in

the Army are likely to lead to changes in the nature of jobs and in successful performance in these jobs. This requires researching a variety of written sources and interviewing experts on future doctrine, equipment, capabilities, threats, and other relevant factors. This information will then be consolidated and used to identify knowledge, skill, and behavioral attributes (KSBs) needed for future success.

An initial exploration of requirements for future jobs led to the identification of several KSBs needed during the next several years. Cognitive aptitude is likely to remain important, as are specific skills such as reading, oral communication, self-management, and working memory. A number of noncognitive or motivational attributes were also identified, including conscientiousness, emotional stability, and need to achieve.

We are building on this earlier work, focusing on evolving concepts regarding the Objective Force and their impact on soldier jobs. Once the research to determine the revised list of KSBs is complete, the next challenge is how to measure them. Attributes that cannot be measured cannot be a factor in enlisted selection.

We will identify or develop measures of the most promising attributes, then evaluate the extent to which they can be used to improve on current selection measures. The evaluation will ask the question: How well do these measures predict performance? Because our measures are designed to predict performance in Objective Force jobs, we must strive to develop measures that address such performance.

For selection, we can examine job demands that are fairly common across military occupational specialties. For classification, or individual job matching, we must identify demands that are differentially important across jobs or are unique to certain jobs or groups of jobs. The effort is complicated in a number of ways. First, one needs to identify the Objective Force jobs. Second, one needs to determine if these jobs can be clustered on the basis of common job demands so the effort of determining demands in multiple jobs can be scaled back to a reasonable level. Third, one needs to explore these jobs at a unit of analysis that will facilitate cross-job comparisons. Our first effort will involve identification of two or more groupings of future jobs that are sufficiently divergent in terms of their demands to likely require differing KSB profiles. Then, in a follow-up effort, we will identify more discrete job groupings to

Projected Key NCO KSBs, 2000-2025

Diagram showing KSBs arranged around "Job Performance in the 21st Century": Adaptability, Integrity and Discipline, Knowledge Management, Effort and Initiative, Job Knowledge, Knowledge of System Inter-Relations, Dependability, Self-Directed Learning, Oral Communication, General Cognitive Aptitude, Supervising Others, General Self-Management, Problem Solving and Decision-making, Motivating and Leading Others, Knowledge of Battlefield Function Integration, Physical Fitness

increase our ability to use differential classification.

Promotion Decisions

The process of identifying the characteristics of those who should be promoted is similar to the process of identifying who should be selected. The issue remains: Who is best qualified to perform a particular job? In this case, the job is at the next higher organizational level. The same questions are asked: What are the job demands now, and how are these demands likely to be impacted by future changes? Then, the projected job demands are used as a basis for determining the required KSBs at the next level. We are nearing completion of a project, known as 21st Century NCOs (noncommissioned officers), which is focused on identifying these required future attributes and on developing promotion tools based on them.

From this project, we have identified a variety of KSBs. A number of those identified as important for junior enlisted soldiers were also identified as important for NCOs, including cognitive aptitude, oral communication skill, self-management skill, conscientiousness, emotional stability, and work motivation. In addition, a number of supervisory skills were identified as well as such complex attributes as understanding how to manage multiple battlefield functions.

Identifying these KSBs was an important first step, but until they could be measured, they could not be useful in guiding promotion decisions. A number of diverse measurement approaches were pursued, in part, to provide multiple measures of the same attributes and, in part, to address the particular challenges of measuring certain KSBs. Measurement approaches included self-reports of attitudes and prior personal history, situational and cognitive aptitude measures, and interviews.

A final step was to determine whether these attributes actually could differentiate between those who could perform the NCO requirements of the 21st century from those who could not. Such an evaluation required the development of performance measures that were sensitive to the job requirements of the 21st century. The job dimensions identified by our future-oriented job analyses were translated into rating scales to be used by supervisors. The attribute measures have now been administered to a large number of job incumbents and linked to these supervisor ratings.

The findings supported the potential of these KSB measures for improving promotion decisions. Work motivation and leadership were found to have particularly strong relationships with performance ratings. Discussions with sponsor representatives concerning how these measures might be used in a modernized enlisted promotion system have already begun.

Conclusion

A critical goal in the development of new personnel tools is to meld them into an integrated assessment and development program. Selection and promotion decisions are not independent—selection provides the pool of applicants from which NCOs are chosen. Nor are assessment and development independent. The attributes that are identified for selection and promotion are also ones that we want to develop in our enlisted soldiers. Thus, as we develop our assessment tools, we are also exploring ways that these can be used for developmental purposes. These tools will also be developed so that they are compatible with the vision of a transformed automated personnel management system.

Our efforts in developing new enlisted assessment tools are paving the way for the envisioned development of new officer assessment tools. The challenges for future enlisted and officer selections are similar: both need to be based on Objective Force job requirements. The efforts involved in identifying the characteristics of Objective Force jobs will help lay the foundation for identifying KSBs for both enlisted and officer personnel. Many of the measures developed for enlisted assessment may have applicability, with perhaps some modifications, for officer assessment. The processes of officer selection and promotion are different from those of enlisted selection and classification, so the manner in which attribute measures are used for officer assessment may well differ from the manner in which they are used for enlisted assessment, but the goal in either case is the same—to identify the most qualified individuals for a particular job.

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HOW ARMY RESEARCH INSTITUTE SURVEYS SUPPORT ARMY TRANSFORMATION

Dr. Alma G. Steinberg, Dr. Morris P. Peterson, and Sidney F. Fisher

Introduction

The transformation of the Army to the Objective Force, and the personnel transformation that supports it, will involve changes in the way the Army handles areas such as recruitment, retention, job assignments, training, performance, and readiness. To fine-tune the evolving process, determine how soldiers are adapting to the changing environment, and ensure success, the Army needs a continuous feedback loop between the field and Army decisionmakers. Attitude and opinion surveys conducted by the Army Research Institute (ARI) for the Behavioral and Social Sciences are a critical tool in providing this feedback.

This article addresses the advantages of using surveys, how surveys use emerging technologies, and how survey results are applied.

Survey Advantages

Attitude and opinion surveys can provide valuable information because survey data meet important criteria. Surveys can be designed to provide data that are quantifiable, valid, reliable, objective, comparable, replicable, capable of being generalized, and capable of indicating trends. As such, surveys provide the Army with a highly cost-efficient means of assessing issues that impact soldiers and their dependents.

Using New Technologies

The personnel portion of the Army's transformation puts strong emphasis on streamlining and using the Web for personnel business processes. In line with this emphasis, ARI has developed tools for conducting automated surveys using PCs, the Internet, and a Web site maintained by Army Knowledge Online (AKO). As soon as soldiers gain full access to the Internet and use AKO regularly, the Army will be able to increase use of the Internet to conduct surveys. Significant economies can be realized in terms of both time and money for distribution, administration, and return of surveys, as well as for analysis and reporting of results.

Automated surveys will also decrease the burden on individual respondents. Currently, ARI uses the *Sample Survey of Military Personnel*, an omnibus survey, to consolidate topics identified by proponent agencies and activities in the Army into one survey, thus reducing survey proliferation. Automating surveys will reduce the footprint even further. For example, the Army will be able to conduct shorter surveys because surveys can be designed to automatically direct individuals past topics that are not relevant to them. In addition, the use of automated surveys will eliminate scanning of survey response sheets and will facilitate faster data analyses.

Using Survey Results

In the past, Army sponsors or proponents, special panels, committees, working groups, and senior Army leaders used survey findings for a variety of purposes. The following are some examples:

• Supporting requests for improving retirement benefits,
• Determining policy changes needed to reduce the number of command declinations,
• Justifying required housing square footage,
• Determining the need for dissemination of information (e.g., for clarification of personnel policies), and
• Determining reasons for joining or leaving the Army.

In the future, with respect to the Army transformation, survey results will be used for the following:

• Monitoring current attitudes and perceptions of soldiers and their families,

• Tracking soldier perceptions of and reactions to transformation actions and policies,

• Identifying problem areas, and

• Providing input for solutions.

Survey areas that ARI will monitor relating to the transformation and its impact include morale, motivation, training needs, career goals, satisfaction with job assignments, and assessments of well-being and readiness.

Conclusion

ARI surveys can help ensure the success of the Army's transformation by providing timely information that Army leaders need to make informed decisions. As the transformation progresses, surveys will take advantage of Web technology. This will result in surveys that are less time-consuming, more efficient, and easier for respondents to use. And, they will give soldiers the opportunity to "tell it like it is" to the chain of command—all the way to the top.

Survey areas that ARI will monitor relating to the transformation and its impact include morale, motivation, training needs, career goals, satisfaction with job assignments, and assessments of well-being and readiness.

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Introduction

While The Army's Well-Being Program encompasses all that we understand to be quality of life, it also significantly expands on that concept by integrating existing quality-of-life programs into a dynamic framework that applies a "systems" perspective. The institutional needs of the Army cannot be adequately addressed without fostering self-reliance and meeting the personal needs and aspirations of its people. Thus, the Well-Being Program provides a standardized, integrated, holistic approach at the soldier, installation/community, and senior leadership levels.

The Army's Well-Being Program is designed to address the physical, material, mental, and spiritual state of Active, National Guard, and Reserve soldiers; retirees; veterans; Department of the Army civilians; and the families of all these groups. The goal is to help everyone prepare for performing and supporting the Army's mission. Beneficiaries of the new Well-Being Program include not only the above-mentioned constituent groups, but also commanders and senior leaders for whom it provides an invaluable resource.

For example, under the program's integrated system, a military spouse who is moving from Fort Hood, TX, to Fort Bragg, NC, will experience seamless access to the same educational and morale, welfare, and recreation (MWR) programs at the new installation that he or she enjoyed at the previous one. As a result, the move will be less turbulent because, under the integrated system, the programs will have universal standards, supports, and services. Furthermore, this system will provide commanders and sergeants major at the installation level the same information that the Army Chief of Staff uses to budget and allocate well-being resources at HQDA. Thus, the Well-Being Program is designed to be a tool for every constituent group, whether one is an Army spouse or a division commander.

Institutional Strength

The Well-Being Program is intended to contribute to the Army's institutional strength, the force that binds all members of the Army community together into a cohesive team. The envisioned end state is an integrated system of

Establishing A Work-Life Balance . . .

THE ARMY'S WELL-BEING PROGRAM

BG James A. Coggin

"Army readiness is inextricably linked to the well-being of its people. Our success depends on the whole team– soldiers, civilians, and families."

**GEN Eric K. Shinseki
Army Chief of Staff
June 1999**

well-being efforts that will aid in meeting the personal needs and aspirations of Army personnel. The system's ultimate objective is to maximize performance, readiness, retention, and recruiting.

The program is designed to bolster and increase the self-sufficiency and self-reliance of individuals and families. Deployed soldiers who are confident of their own self-sufficiency and their families' self-reliance are far better able to concentrate on successful mission performance. Furthermore, soldiers whose standard of living (i.e., pay, housing, medical care) is equivalent to that of the society that they defend are more prone to focus on the intrinsic benefits of selfless service, thereby increasing retention. Citizens who see opportunities in the Army to fulfill and satisfy their individual aspirations are more likely to enlist and re-enlist. And, an Army with recruiting and retention successes and with soldiers focused on successful execution of their mission is a force that is prepared and ready to fight and win the Nation's wars. The readiness of the Army, therefore, is, as GEN Shinseki stated, "inextricably linked to the well-being of its people."

Lines Of Operation

The framework for the Army's Well-Being Program relates individual needs

with Army functions that are designed to meet those needs. To effectively manage this framework, well-being needs were identified and categorized within one of seven lines of operations. Each line of operation has a desired end state that is intended to contribute to the personal (physical, material, mental, and spiritual) state of Army soldiers, civilians, and their families.

The seven lines of operations are as follows:

• An operating environment (i.e., command) that is characterized by safety, security, and optimum personal readiness;

• Comparable pay or compensation that is complemented with training and programs designed to assist individuals in achieving their personal financial aspirations;

• Quality, affordable housing for both single soldiers and Army families as well as a safe, comfortable working environment that is conducive to mission accomplishment;

• Quality, accessible, and cost-effective health care services that are enhanced by the promotion of healthy lifestyles;

• A system that facilitates the attainment of individual education requirements and meets the unique

individual needs of all students from the Army community perspective;

• Family programs that assist in developing self-reliant and resilient Army families who remain connected to the Army, are prepared for family challenges, and are able to pursue employment and career development throughout one's Army career; and

• MWR services and programs that help connect soldiers, civilians, and their families to the Army and provide access to a wide spectrum of individually fulfilling MWR activities.

This framework gives Army members a holistic understanding that the Army is pursuing fair, balanced, and equitable compensation benefits; consistently providing safe, affordable, excellent housing; ensuring quality health care; enhancing community programs; and expanding on educational and retirement benefits by developing universal standards and metrics to evaluate and deliver these programs.

Hierarchy Of Needs

In a "values-based" Army, everything that a soldier does is well-being. This foundation of service is the bedrock on which well-being rests, and on which the Army has developed a framework to manage well-being efforts and programs. The framework relates individual needs with Army functions that are designed to meet those needs. Individuals fulfill three roles based on an accepted hierarchy of needs: the role of provider, the role of the Army team member, and the role of the individual.

The *role of a provider* is intended to meet the essential needs affiliated with the concept "to live." Programs that provide these basic needs (physical and material needs related to shelter, food, and safety) comprise the essential function of Army well-being.

The *role of an Army team member* satisfies the need "to connect" (i.e., acceptance, social interaction, contribution). Programs that create a unique Army esprit de corps that connect individuals to the Army team comprise the defining function of Army well-being.

Finally, the *role of a person or an individual* meets the need "to grow" mentally and spiritually, to be creative and productive, and to use and expand one's capabilities. Programs that are designed to assist an individual in grow-

ing comprise the enhancing function of Army well-being.

Linking Needs

The Well-Being Program is designed to provide a clear link between individual aspirations and the Army's institutional outcomes (performance, readiness, retention, and recruiting), all of which are strategically critical to sustaining a healthy Army for the future. The Army plans to do this by ensuring an effective delivery system for programs, adequate resourcing, and standardization of quality services. The motivating force is ensuring that the Army consistently and adequately provides for its people while simultaneously improving readiness. Helping individuals connect to the Army, feel part of the team, and derive a sense of belonging is critical to maintaining the link between the soldier and his family and the readiness of the force.

In June 2002, the Army began establishing well-being laboratories at the installation/community level as a "proof of principle" to determine if the tenets developed at the well-being strategic level are valid at the installation/community level and to determine how to implement community well-being Armywide. It is anticipated that from these laboratory sites, analyses will be made of well-being programs within the user community to determine functions that affect well-being; assessments will be made of the delivery and receipt of well-being products and services; recommendations made to improve the effectiveness of well-being products, services, and programs; and methods determined for effectively communicating well-being to all constituents.

The long-term goal in establishing the new lab sites is to produce a detailed plan for implementing well-being programs across the Army that enhance the current and future well-being of soldiers, civilians, and their families.

Conclusion

The HQDA Well-Being Office is not the proponent or manager of well-being programs and does not directly allocate resources for these programs. It does, however, provide an integrated system of standards and metrics that moves the Army toward the Objective Force. For

instance, an effective well-being program will ensure that the proponents of health program goals and objectives are in sync with the goals and objectives of proponents of MWR programs.

Well-being is the human dimension of Army transformation. As the Army changes, the needs of its soldiers, civilians, and their families will also change. Well-being represents the Army's resolute commitment to prepare now to meet today's needs as well as future needs. The Army's Well-Being Program is a driving force for a successful transformation because it directly impacts the human dimension of the force and integrates all quality-of-life programs under one umbrella. It changes the Army culture by bringing into balance the mutually supporting demands and expectations of our Army and its people.

Well-being will continue to be inextricably linked to the capabilities, readiness, and preparedness of the Army as we transform to the Objective Force. The program strives to provide greater predictability in the lives of soldiers and their families. An effectively designed, executed, and delivered well-being program means that soldiers and civilians will not be put in the position of choosing between the profession they have selected and the families they love.

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THE ARMY ENTERPRISE PERSONNEL DATABASE

LTC(P) Gregory J. Fritz and Dr. Kenneth L. Bedford

"Army transformation will place increased demands on our human resources systems in terms of speed, accuracy, and accessibility. Also, we need better analytical and predictive tools for recruiting, distributing, and managing our multiskilled soldiers."

LTG John M. Le Moyne
Army Deputy Chief of Staff, G-1

Introduction

Timely, accurate, and authoritative data are essential to the success of the Army's personnel transformation. Currently, Army personnel information resides in dozens of disjointed databases. In the future, Army personnel systems will leverage the power of modern databases and network connectivity to minimize the number of databases and maximize their use.

The Army Human Resources (HR) System requires accurate data from the time a recruiter contacts a potential recruit, through the term of service, to the point a soldier transitions to civilian life and/or retires. This personnel management structure is depicted in Figure 1. The recruiting mission derives from an accurate inventory of soldiers already in service, their skills, and their locations. Likewise, the operational employment of soldiers and logistical
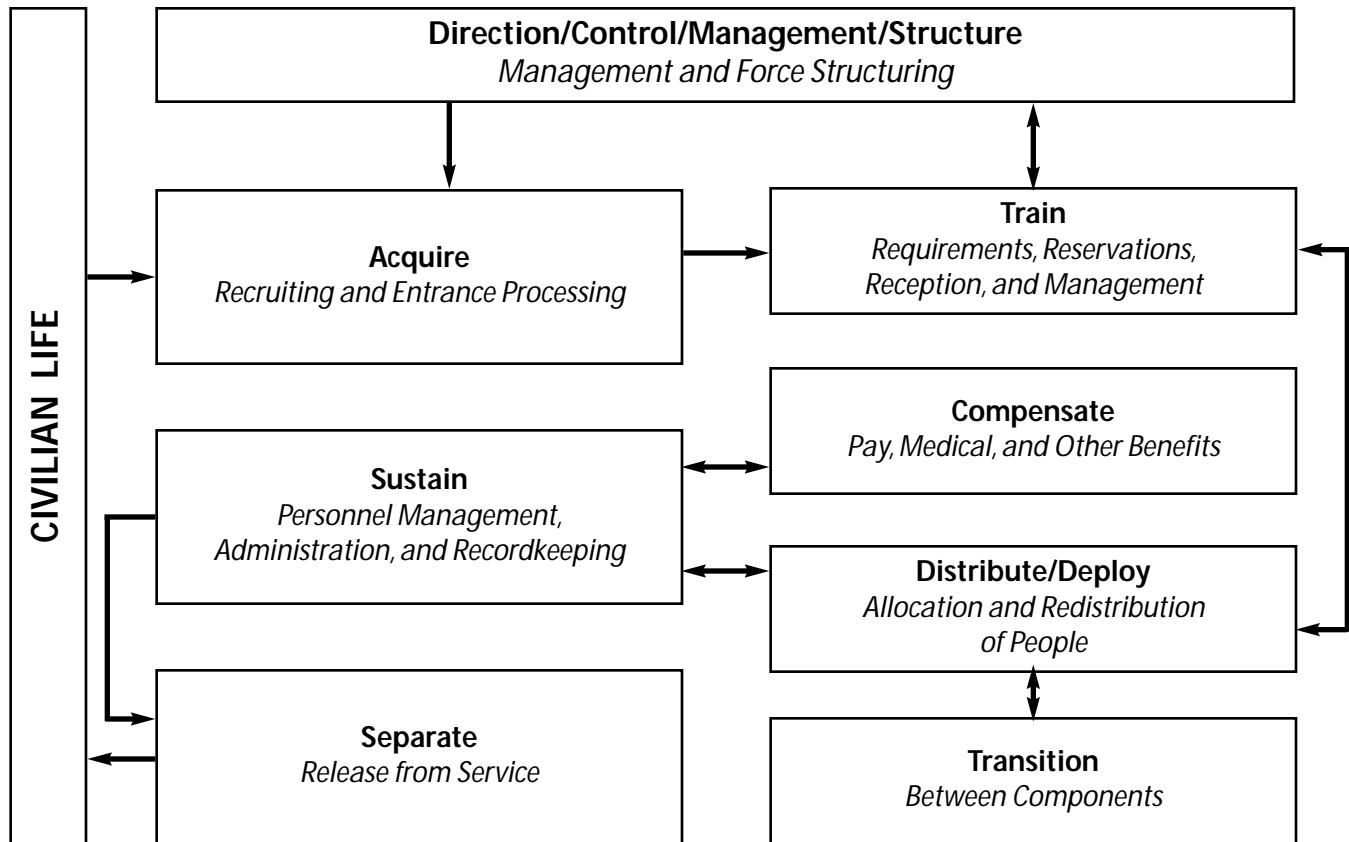

Figure 1.
The soldier life cycle

support of soldiers also relies on accurate data. Further, the administration of soldier benefits also requires timely and accurate data. Thus, it is no exaggeration to emphasize the importance of timely, accurate personnel data throughout the soldier's life cycle and across the spectrum of Army missions and functions.

The cornerstones of Army human resources are the personnel readiness and strength accounting of Army units, yet each supporting system has been developed using installation-level groupings of soldiers. This means that soldiers are recruited, trained, assigned, tracked, and separated with imprecise and outdated information about the needs of Army units. This approach evolved from a decentralized paper-based Army to a decentralized automated Army without fully capitalizing on modern technology. Modern databases, Web technology, and increasing bandwidth enable centralization and data accuracy far greater than the "stovepipe" systems still used throughout the Army. These technologies are essential for transforming to an information age Army.

The transformed Army will employ units assembled from disparate installations and with greater reliance on Reserve components. Personnel transformation will enable better visibility of composite units by implementing a single, unified Army Enterprise Personnel Database that contains data about all soldiers, regardless of component or installation, and is Web-based and accessible by authorized users from anywhere in the world.

The Army Enterprise Personnel Database will exploit legacy and developmental databases to facilitate the Army's migration to the Defense Integrated Military Human Resources System (DIMHRS). Objective Force personnel systems will evolve from the current systems to facilitate soldier self-service and automated workflow for management review and approval to ensure accurate and current data.

Current HR Systems

Today, Army personnel data are spread across hundreds of different systems, each designed for a piece of the soldier's life cycle. These systems support information-processing requirements in specialized areas from recruiting and enlistment to training, separation, and all points in between. Each component—Active, Reserve, and National Guard—has its own systems, specifically designed to meet the differing statutory and regulatory standards for 10 U.S.C., *Armed Forces* (Title 10) and 32 U.S.C., *National Guard* (Title 32) soldiers. Each of these systems has its own databases, where each database holds much of the same data. Attaining consistency across so many databases requires considerable maintenance of the information and its interfaces. Further, attaining consistency consumes considerable time and money as well as the intangible, but sizeable, opportunity cost of data inaccuracies. Current HR system problems include the following:

• There are a large number of personnel databases with limited interoperability. Interfaces are typically batch transactions and result in high error rates. Latency of input by field to "top of the system" and for movement of soldiers between components results in poor visibility in a mobilizing Army. In addition, it is costly to maintain the many system interfaces and to update them when new systems come online or when Congress mandates change.

• There is a need for flexible force structure and unit management data and processes. Processes and structures are "hard-coded." Army transformation and Objective Force realization will drive changes to the force structure and will be dynamic, thus pushing the need for a data-driven model.

• There are problems integrating Reserve components. The transition and mobilization of soldiers often results in soldiers "disappearing" from the databases for weeks or months as they are deleted from the losing component, but not immediately added to the gaining component.

Future Requirements Support

The Army is already scheduled to lead DOD in transitioning to DIMHRS. DIMHRS has chosen PeopleSoft 8, a commercial product offering an Internet architecture that enables universal access to authorized users via a Web browser across low bandwidth networks. Migration to DIMHRS will require radical cultural, organizational, and process changes; will force a

change to "position management;" and will require "clean data" from one "authoritative data source," with consistent business rules.

Business process re-engineering is key to Army personnel transformation. Data entry, approval, and other functions must be decoupled from paper forms and local computers. In a Web-based environment, collecting the right data, from the right source, with automated workflow for "point-and-click" approval becomes the new business model. Authoritative data can then be shared across the Army based on need to know, using the principles of a knowledge-based organization. The key element to this path forward is a consolidated Army Enterprise Personnel Database, where these Web-based applications will perform real-time transactions.

Process re-engineering reduces redundant functionality; enables migrating functionality to the Web; enables modularity and flexibility in application implementation to support Army transformation and the Objective Force; and forces cleansing of the Army's personnel data and personnel processes as a stepping stone toward DIMHRS implementation.

Architectural Concept

Converging to a single Army Enterprise Personnel Database and migrating to Web-based functionality are critical enablers of personnel transformation. The database will provide enterprise data visibility to enable applications that support the following:

• Functionality across the entire soldier life cycle;
• Legal requirements (Title 10, Title 32);
• Operational requirements such as future passive accounting of personnel (e.g., biometric check-in/check-out of a unit, a building, or a combat vehicle); and
• Operational requirements of commanders (single, timely, and accurate data source for reports such as strength accounting, in-transit visibility, casualty reporting).

The enterprise database can, and probably should, evolve into the single database for most applications across the Army enterprise. With a single
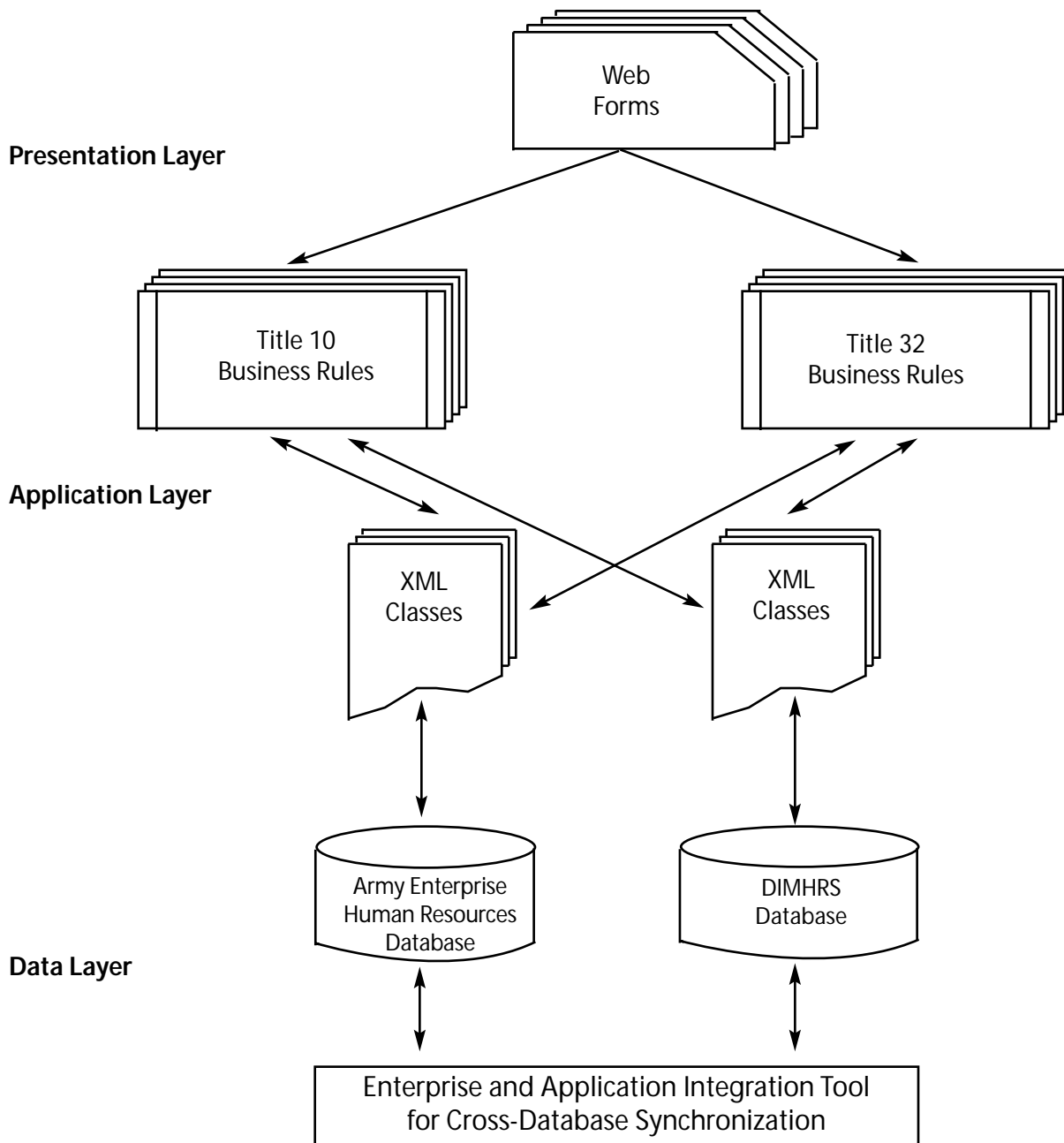
Figure 2.
Three-tiered architecture

database, there is no question of whose data is right because there is only one authoritative source of data. Privileges to read and/or write to specific data elements must be controlled centrally, but the actual application will be modularly decoupled from the database. Thus, one set of forms could call separate sets of business rules and workflow processes to support Title 10 and Title 32 requirements.

Implementation Hurdles

Implementation hurdles are less technical than political or cultural hurdles. While central hosting is a preferred technical option, it raises issues of local ownership of data and processes versus Army ownership. Incorporating decentralized functional definition of the applications to keep the business process close to the functional users will help alleviate those concerns. However, retaining strict

control and central management of the data model and interfaces is essential.

Implementation of this approach will use a three-layer model (Figure 2) that is discussed below:

• *Presentation Layer.* A Web-based user interface eliminates the need to deploy code to the desktop or field. The user interface delivers content while providing navigational and interactive features such as Web forms, security

> *Building the Army Enterprise Personnel Database will transform the Army's management and support of its soldiers and enable the Army to leverage Web technology and commercial best practices.*

sign-ons, and reports. Benefits include flexibility, interoperability, and substantially lower operations and maintenance (O&M) costs.

• *Application Layer.* This layer includes business logic, workflow, and access control. Variables used in the application code should be decoupled from the actual database design by using eXtensible Markup Language (XML) to translate the variables to the relational tables. Thus, future changes to the database, or completely switching to a different database (e.g., DIMHRS), will only require updating the XML but not the application code. Benefits include a modular and flexible development environment that reduces rule conflicts that could occur if implementing inside the database and provides better visibility into business rules "as coded," thus leading to a reduced O&M tail.

• *Data Layer.* This layer entails a clean, authoritative data source that is implemented centrally. The data model is driven by business needs and closely adheres to appropriate data standards. This data model could be derived from *ab initio* standards or from a commercial off-the-shelf product (e.g., PeopleSoft 8) implementation. Benefits include improved data integrity and data sharing and substantially lower data management costs.

Conclusion

The Army's migration from the current disjointed, complex state of personnel systems to a simpler future state requires a sound architecture that fits the Army's business environment and anticipates DIMHRS requirements. The essential first step is moving to a centralized Army Enterprise Personnel Database. The benefits of implementing this single database include the following:

• Improved data accuracy, consistency, and timeliness for personnel readiness reporting, strength accounting, and more accurate logistical support;

• Better accounting for movement of soldiers between components;

• Reduced maintenance costs resulting from reducing or eliminating data interfaces;

• Reduced opportunity costs from inaccurate or inconsistent data; and

• Clear migration path to DIMHRS.

Among all the initiatives supporting Army transformation, personnel transformation offers some of the greatest potential benefits for soldiers and their families. Building the Army Enterprise Personnel Database will transform the Army's management and support of its soldiers and enable the Army to leverage Web technology and commercial best practices. Leveraging Web technology will reinforce successes like **http://www.goarmy.com** and **http://www.goarmyreserve.com** and will transform our personnel systems for the Objective Force.

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Lessons Learned From The Business Community . . .

HOW THE SHORT RANGE AIR DEFENSE ARTILLERY IS EXPLOITING A STRATEGIC CRISIS POINT

LTC Scott E. Shifrin and Anita Wood

Introduction

Under Andrew Grove's leadership as President and CEO, Intel Corp. became the world's largest computer chip producer, the fifth most admired company in America, and the seventh most profitable of the Fortune 500 companies. Grove's insights and experiences offer a creative new way of dealing with the "nightmare moment" every leader dreads—the moment when massive change occurs and all bets are off.

The U.S. Army is in the midst of massive change as it redefines its roles and missions and determines how to implement a strategy to achieve the Objective Force. The Army can draw lessons learned from common business practices, thereby assisting military leaders in the transformation to an Objective Force Army. This article examines strategic crisis points from business that directly parallel the Army's transformation of the roles and missions of the Short Range Air Defense (SHORAD) weapon system.

The current SHORAD weapon systems consist of the line-of-sight Stinger missile mounted on a High Mobility Multipurpose Wheeled Vehicle (collectively called the Avenger), the Bradley Fighting Vehicle (collectively called Linebacker), and the Man-Portable Air Defense System. The mission is to protect maneuver forces and critical assets from air and missile attack.

Strategic Inflection Point

In his book *Only the Paranoid Survive: How to Exploit the Crisis Points That Challenge Every Company and Career*, Grove defines the strategic inflection point as the critical point where transformation must occur. This happens when the balance of forces shifts from the old ways of operating and doing business and is transformed into the new process.

Before the strategic inflection point, the organization is simply doing business as usual. But something changes, and a new approach, a new thought process, a new strategy, or a new mode of operation is required or failure will be imminent. What worked in the past doesn't work anymore. The strategic inflection point is the catalyst for change and is the *single factor* that causes action. When a strategic inflection point occurs, all past rules shift fast, furiously, and forever. In business, strategic inflection points can be set off by almost anything: intense competition or changes in regulations, technology, leadership, or funding.

A prime example of a strategic inflection point can be seen when Wal-Mart builds in a small town—everything changes. The hometown store can't match Wal-Mart's logistics, computerized inventory management, large volume-based purchases, and companywide training programs. Wal-Mart's customer service, can-do attitude, and capability to lower prices corner the market. The hometown store's failure to either recognize or adapt to the change allows for a quick transformation shift.

Intel's Inflection Point

The computer industry has changed significantly throughout the last 20 years. During the 1980s, high-profile computer companies (IBM, DEC, Sperry Univac, and Wang) sold computers as a "company package" that involved proprietary design, chips, computers, operating systems, and application software that was marketed and sold by company salespeople. This was an expensive "vertical" purchase where the customer got only what a particular company offered by purchasing their proprietary computer package. In the mid-1990s, a crisis point in the industry occurred with the explosive rise in microprocessing power, the popularity of personal computers, and a dramatic drop in price. This changed the entire structure of the computer industry and a new "horizontal" industry emerged to such an extent that no one company had the total edge on the market. A consumer could "mix and match" microprocessors, computer manufacturers, operating systems, and any one of many

SHORAD
Strategic Crisis Point

The Inflection Curve

EAADS / SL-AMRAAM

Air Defense Transformation
Goes On To New Heights

Inflection Point

Legacy Force
Air Defense Declines

AUSA
Speech
Oct 99

Avenger/Stinger

Figure 1.

off-the-shelf software applications at retail or computer stores. The computer industry's transformation from the vertical "cradle-to-grave" model to the new horizontal model took place over many years in small incremental steps. Intel had to adjust to the new market paradigm or face extinction.

What happened to cause this change? In retrospect, Grove identifies the strategic inflection point as when the Japanese entered the memory production market and began research and development of new chips to lead the world market. In one Japanese company, it was reported that the memory development activities alone were conducted in a large, high-rise production building where, on separate floors, designers researched and developed several new generations of memory. Compare this to the relatively small amount of memory chip development in the United States, with little to no investment in research and development, and it is easy to see why the United States was looking over its shoulder.

U.S. companies could not compete against Japanese low-cost, high-quality products. The computer industry was reliving the tribulations of other U.S. industries (television, automobile, steel manufacturing, and machinery) that had felt the impact of a strategic inflection point from aggressive Japanese competition. Understandably, management's first reaction to a strategic inflection point is denial. Some U.S. industries were losing the fight and losing money because they failed to recognize the Japanese business threat.

This transformation shift in the computer industry caused a nightmare moment for Grove and threatened Intel's continued success. Fortunately, Intel's management recognized the shift before it was too late. They changed their legacy production and were able to adapt. Grove took charge and hoped the others would follow his lead. He recognized the need to expand his knowledge base, sponsored several grueling management-level debates, and spent hours questioning and listening to employee concerns.

In the end, Grove succeeded and was in the forefront of the computer industry by transforming and adapting Intel's business from memory chips to microprocessors. Intel increased production and marketed its microprocessor as the "brain" for any IBM-compatible computer while concurrently phasing out its legacy memory production line. Intel's lessons learned from the strategic inflection point were as follows: notice the shift, get smart on the cause of the new shift, strategically adapt to the shift, prepare the business to transform, and provide the resources necessary to make the transformation happen.

Army's Inflection Point

In the hands of good leaders, a strategic inflection point can be an ace. The Army leadership has committed itself to turning this strategic inflection point into a positive force, to win both in business through the acquisition community and on the battlefield through the acts of soldiers.

The 1990s were marked by the superior strength of the U.S. Army as it crushed Iraq in the Gulf War. After the war, reviews were conducted to determine the strengths and weaknesses of the operational and technical capabilities of the Army and how they might be improved. It is not likely that an adversary will allow months of buildup and preparation, access to naval ports, and an opportunity to infuse the latest weapons and technology into maneuver units prior to conflict.

Threat Proliferation Trends

Platforms

Unmanned Threat
- **Tactical Ballistic Missile**
- **Cruise Missile**
- **Unmanned Aerial Vehicle**
- **Rocket**

Manned Threat
- **Attack Helicopter**
- **Aircraft**

Today   2016

Payloads

High

Proliferation Trends

Low

Weapons of Mass Destruction

Real-Time Downlink

UAV Increased Threat to Maneuver Force

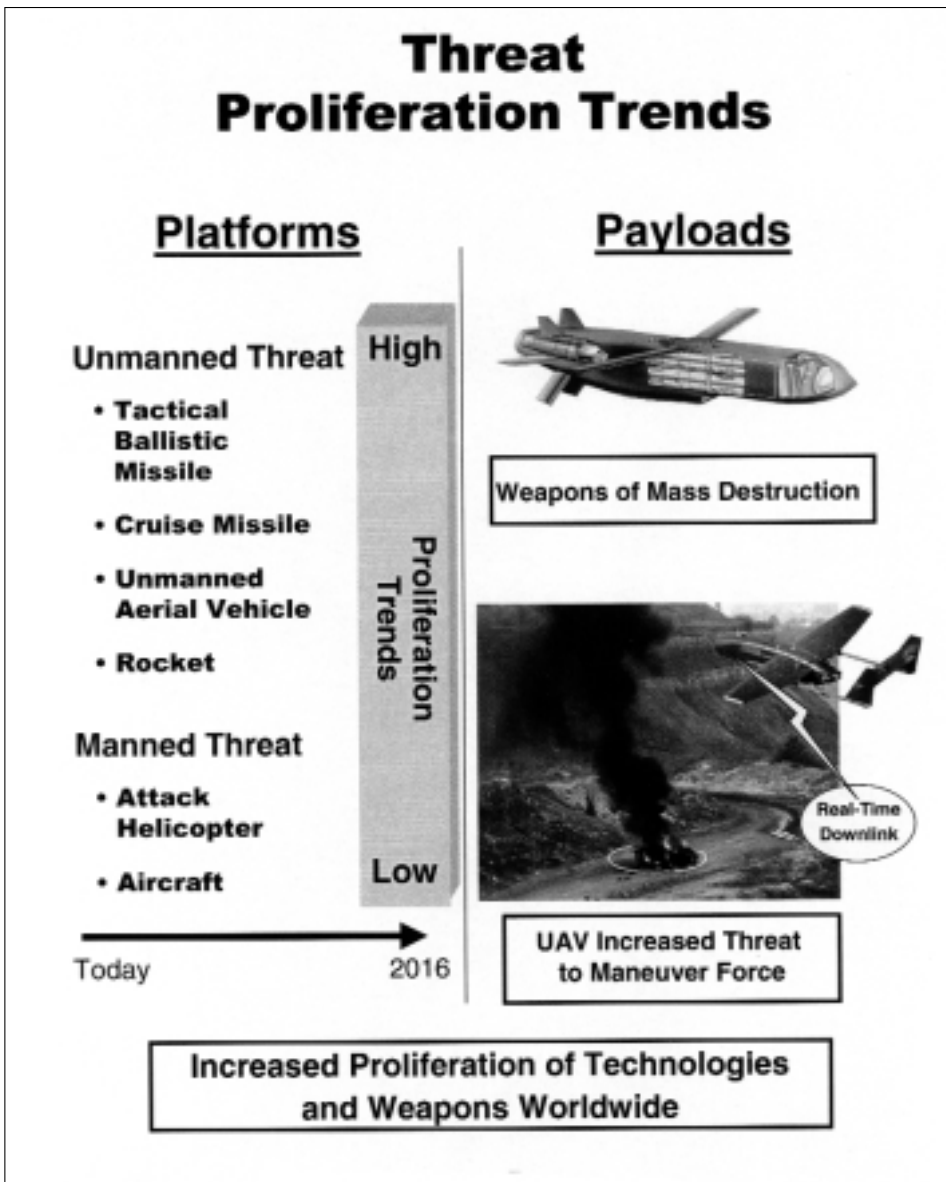**Increased Proliferation of Technologies and Weapons Worldwide**

Figure 2.

The Army was too heavy, had too long of a logistics tail, and was not agile and mobile enough to react to an unforeseen crisis around the world in a timely manner. Identification of these deficiencies was the beginning of the U.S. Army's strategic inflection point. It also marked the beginning of a new era—the Army began infusing advanced technologies into the maneuver forces by developing the digitized division and began transforming the Army to the Objective Force. This change for the Army is a crossroads that can mean either an opportunity to rise to new heights or signal the beginning of the end as weapon system developers adjust to transformation.

SHORAD Inflection Point

In October 1999, Army Chief of Staff GEN Eric K. Shinseki delivered the now-famous speech to the Association of the United States Army (AUSA), unveiling the Army vision for meeting the Nation's requirements today and in the future. The Army is transforming into a force that is strategically responsive and dominant at every point on the spectrum of conflict. This AUSA speech was a realization to the SHORAD community that it had to transform and better define its role on the future battlefield or be left behind. This was the critical and defining moment for SHORAD (Figure 1). For SHORAD, it means a strategic inflec-

tion point of huge proportions. SHORAD is in the midst of a major transformation, attempting to realign, adapt to the new goals and direction of the Army, redefine roles and missions, and develop a new and more lethal path ahead for the Objective Force.

To understand why the strategic inflection point occurred, we must begin by looking at the SHORAD Legacy Force. The Stinger missile has performed admirably during the last 20 years—first, with the Afghanis when the Soviets invaded Afghanistan, then during the Gulf War, and today in the struggle against terrorism. SHORAD must take action to position itself against an evolving threat with increased standoff capability, develop new and proactive methods for attacking the threat, and be able to quickly integrate new technologies when they become available.

With competition for fewer resources, funding for the Stinger-based platforms (Avenger and Linebacker) has been rescinded. As a result of the lack of funding, both the combat developer and the materiel developer recognized the need to transform the maneuver air defense force. New ways of doing business had to be developed because SHORAD had no clear path ahead to protect the Army's maneuver forces from air and missile attack as they transform to the Objective Force.

SHORAD Path Ahead

The SHORAD transformation began by re-evaluating the threat to the maneuver force at the unit-of-action and unit-of-employment levels for the Objective Force timeframe. The SHORAD force now must concern itself with a new and growing threat, including beyond-line-of-sight targets— unmanned aerial vehicles (UAVs) (both reconnaissance and combat), cruise missiles, and the traditional rotary- and fixed-wing aircraft.

In the far term, SHORAD must evolve to defeat rockets, artillery, and mortars (Figure 2). The air defense materiel and combat developer communities looked hard at future technologies, developing a leap-ahead or evolutionary acquisition approach that would provide for drastically improved capabilities in the near term, while

SL-AMRAAM
Army Tenet Linkage

Sustainable
- Tri-Service missile
- Army common platform

Deployable
- C-130/CH-47 transportable
- Army common carrier-based

Lethal
- Threat overmatch now and in the future
- Precision engagement capability

Responsive
- Rapid force projection
- Leverages multiple sensors to conduct engagements

Survivable
- Dominate extended battlespace
- Long-range targeting and acquisition

Versatile & Agile
- Force tailorable
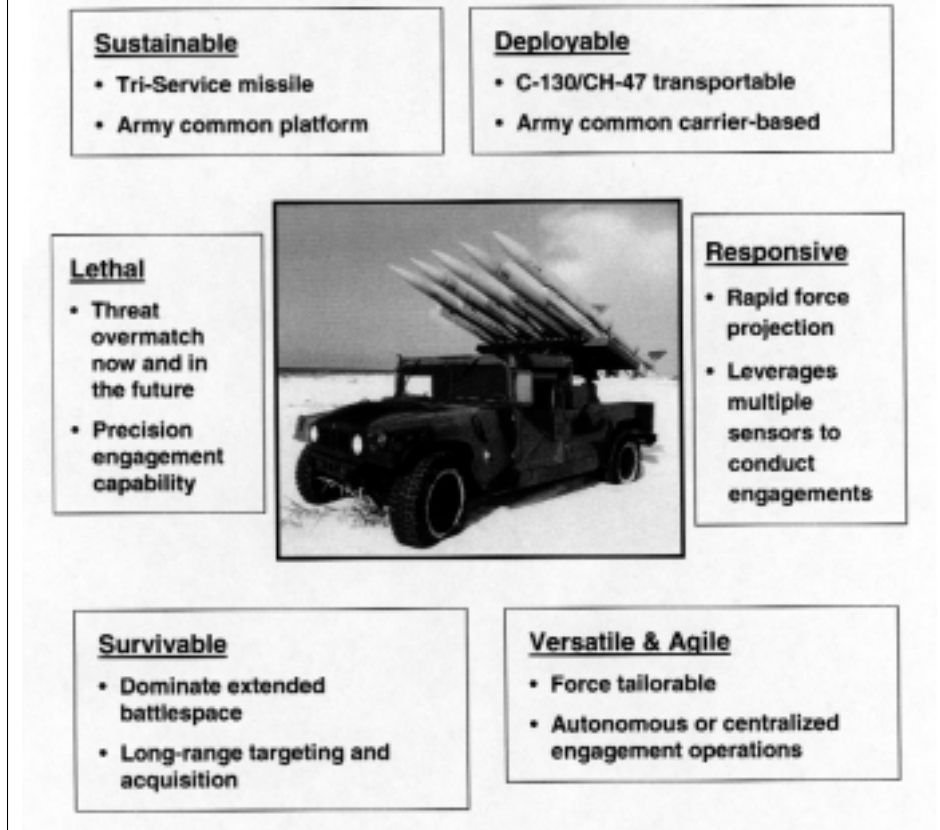- Autonomous or centralized engagement operations

Figure 3.

evolving the weapon system as the Army transforms to defeat threats in the far term.

Although still evolving as a result of the crisis point, the Enhanced Area Air Defense System (EAADS) appears to be able to provide that opportunity and eventually replace most of the Stinger-based force. Consistent with the development of the Future Combat Systems, the initial capability of EAADS is the Surface Launched Advanced Medium Range Air-to-Air Missile (SL-AMRAAM). This initial system-of-systems capability includes the launcher; missile; external sensor; and battle management/command, control, communications, computers, and intelligence. This capability will enhance air defense by providing a netted and distributed architecture that is compatible with the

current SHORAD force and has a missile that is interoperable with the other Services. The EAADS concept fits well with the Army Chief of Staff's Objective Force tenets—highly deployable, threat overmatch across the entire spectrum of conflict, and force-tailorable based on mission requirements (Figure 3).

SHORAD Lessons Learned

EAADS will be developed to evolve in lock step with technology and warfighter tactics, techniques, and procedures. Although the initial capability of EAADS (SL-AMRAAM) is a kinetic energy solution, it will have the ability to evolve to other more advanced kinetic energy and directed energy solutions as they mature. EAADS is an open architecture designed to avoid any dead-end solutions. Fighting

through the strategic inflection point is not a fast or easily achievable process. It must be taken in small incremental steps over several years (much like Intel). It also requires the support of senior leaders as they articulate the future vision while listening to the community.

Conclusion

The Army's vision of transformation is a proactive step. Army leadership saw the strategic inflection point early enough and took the appropriate action to counter the expected future threat. The SHORAD development community is diligently working toward the Objective Force goal and is applying the lessons learned from the business community. Other Army development programs could very well benefit from the lessons learned from the SHORAD effort. Countless hours of discussions, budget drills, requirements analyses, doctrine definition, planning, team building, and other exercises are paving the road to the new way of doing business. We are operating under new guidelines with a new objective. As technology evolves, EAADS is the future for SHORAD. SHORAD has the competitive edge and path forward as the air defense Objective Force rises to new heights after positively responding to the strategic crisis point.

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ACE

A Personal Observation . . .

THE SUMMER 2002 ACE PROGRAM REVIEW BOARD PROCESS

Ronald J. Rapka

Introduction

The Acquisition Career Experience (ACE) Program is intended to recruit college students with multi-disciplined backgrounds for civilian acquisition positions throughout the Army. It is a chance for students to gain invaluable experience while participating in a paid 2-year part-time program. Selected students have the opportunity to work at numerous Army organizations throughout the country, are assigned a mentor for on-the-job training, and are given challenging work assignments. The ACE Program's pilot year began in the summer of 2000 when seven students were placed in five Army acquisition organizations. During the program's second year, in the summer of 2001, 55 students were also placed at a number of Army acquisition organizations.

In March 2002, I was selected from the U.S. Army Communications-Electronics Command (CECOM) Acquisition Center at Fort Monmouth, NJ, to participate in the ACE Review Board process for the program's third year, 2002. I was joined by four other individuals who were selected from various Army activities, including three civilians and one military officer. Our challenge was to develop evaluation criteria, review and rate all student application packages, identify best-qualified individuals, and make recommendations for future ACE selection boards. This article relates our observations and

suggestions regarding both the ACE application and the board rating processes.

Evaluation Criteria

After reviewing the ACE Program's history, procedures, and policies, we developed evaluation criteria that would assist us in rating each student's application. Our evaluation criteria included grade point average (GPA), employment history, leadership roles, recognition and awards, publications, and the extent to which an individual was "well-rounded." The evaluation criteria were then used to rate each candidate's package, which consisted of a letter of introduction from the student, letter(s) of recommendation, college transcript, and résumé.

Additionally, an overall numeric rating was developed with scores

ranging from a low of 1 to a high of 6, with half-point increments (e.g., assigned scores could be 1.0, 1.5, 2.0, 2.5 … up to 6.0). Each rater assigned an overall score per application package. The five scores were averaged to obtain one composite score for each applicant. Individual scores assigned to each package were kept hidden from the other raters; therefore, we did not know what score the other raters were assigning until the review board session was basically over. We also decided in advance that if any individual score assigned by a rater deviated by more than 2 points, then those raters would meet to discuss the applicant's package in an attempt to reconcile the disparity. In our case, this never occurred.

Application Ratings

For several days, we rated 220 student applications from colleges and universities throughout the country. Unfortunately, at the time of this writing, there are only 75-80 positions that are currently funded for FY02, and this includes returning ACE students from the previous year. Competition was fierce, and those selected for the 2002 ACE Program should be proud of themselves because, unless additional funding can be obtained, only about 35 percent of the applicants will be chosen.

After application packages were reviewed and rated, a Relative Standing List (RSL) (a ranking of applicants' weighted scores) was established. Applicants may choose from seven geographic regions, and a separate RSL was produced for each region. (I'm located in the Northeast Region, and there are 26 slots allotted for the 2002 ACE Program in this region. Among the installations where applicants can be assigned are 16 slots at Fort Monmouth, NJ; 7 slots at Picatinny Arsenal, NJ; 2 slots at Fort Drum, NY; and 1 slot at Natick, MA.)

Recommendations

At the conclusion of the board, we provided the following recommendations and guidance to improve the selection process for future ACE selection boards.

Résumé Package. Applicants seem unsure of what information to include in their résumé package and how to format the documents. We recommend that future applicants be given general guidance in these areas.

Academics. The board considered the applicant's grades to be important, but less important than the applicant being a well-rounded person. In addition to highlighting academics in their packages, applicants should emphasize any leadership roles and participation in volunteer, sports, and other extracurricular activities. Applicants should also indicate if they are working full time to fund their education.

Letters. The faculty letter of recommendation and the applicant's introduction letter should be signed. The introduction letter should also include a sentence or two about the college and any unique programs, if applicable.

Selectees. Generally, those selected were well-rounded individuals who indicated leadership roles at work or through other activities, had strong grades with correlation to chosen career field and curriculum contents, participated in extracurricular activities such as volunteer work, and were members of academic or professional clubs or associations.

Army Acquisition Workforce (AAW) Issues. Field of study for applicants should be related to AAW positions. In addition, applicants should indicate interest in multiple career fields, if applicable.

Other Observations. The board looked at course curriculum for technical content. Applicants should highlight latest GPA in their unofficial transcript(s).

Selection Process

Board Guidance. Publishing basic criteria for rating applicants could save considerable time, and the board could then decide how to apply the criteria. We recommend that the same general criteria be used for each board, rather than each board setting its own. Notwithstanding the above, the guidance the board received and the practice of rating sample applications were helpful for the board to come to consensus on how to rate the applications.

Board Procedures. The board used a point system, with ratings 2.0 through 6.0 (highest). The board used evaluation criteria that included GPA, extent of training and experience, leadership, volunteer activities, awards, and published works.

Board Support. Acquisition Support Center personnel provided excellent support to the board. The applicant packages were well organized for review. However, to accelerate the process in the future, we suggest that each applicant's GPA be highlighted during assembly of the packages for board review.

For additional information on the ACE Program, go to **http://dacm. rdaisa.army.mil/Acepage/index.htm**, or contact Janice Kurry at (732) 427-1692 or **Janice.kurry@mail1. monmouth. army.mil**.

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Introduction

Your mission, if you choose to accept it, is to take charge of a struggling major Army acquisition program currently in program definition and risk reduction. The project has had serious technical problems, schedule delays, budget changes, and congressional scrutiny. Expect to interface with every major U.S. aerospace contractor while managing nine directorates within your project management office (PMO). Does this sound like an appealing job opportunity? Maybe not, but this is the situation COL Patrick O'Reilly found when he took the Project Manager, Theater High Altitude Area Defense (PM, THAAD) charter in July 1999. This article explores how one PM took a challenged program and turned it around by cultivating a culture of program management best practices. The resulting program's success was recognized when PM, THAAD won the 2000 Army Project Manager of the Year Award. Although THAAD is a large

PROGRAM MANAGEMENT MISSION IMPOSSIBLE

MAJ Lloyd C. Crosman

project, the majority of concepts outlined could apply to any program, regardless of size.

PM, THAAD's success cannot be attributed to any single individual or change. Without the clear understanding and steadfast support of the THAAD Deputy PM and Chief Engineer, initiatives to improve THAAD would not have been successful. It was a hard-working team that integrated program management best practices, critical enablers, and motivational leadership to turn the program around. Most important, this

turnaround was accomplished without losing sight of the warfighter.

Management Model

The first step in turning the program around started long before the charter changed hands. O'Reilly understood that he had to do his homework upfront if he expected a significant change. He planned to immediately institute a new culture with an intentional "shock effect." First, he had to determine what management model he would leverage to develop a world-class program office. He decided to use a model from *Levers*

THAAD Program Management Model

- Integrity
- Standard of Excellence
- Mission
- Teamwork

Belief Systems
Inspire and direct the search for new opportunities

Core values

Boundary Systems
Set limits on opportunity-seeking behavior

Risks to be avoided

- Quality
- Risk
- Statement Of Work and Integrated Master Plan
- Operational Requirements Document/ Specifications
- Schedule
- Budget

Government and Contractor Business Strategies (Maximize Congruency)

Strategic uncertainties

Critical performance variables

- Informal communications
- Weekly cycle of IPT meetings
- Troop musters
- Executive leadership workshop
- Off-sites

Interactive Control Systems
Stimulate organizational learning and the emergence of new ideas and strategies

Diagnostic Control Systems
Motivate, monitor, and reward achievement of specified goals

- Earned value management
- Critical path analysis
- Metrics

Figure 1.

Management Review/Decision Cycle
Contractor/Government IPT Status Meetings

Lower-Level IPTs
Review/plan/execute
• Software metrics
• Earned value data
• Schedules
• Technical performance measures
• Engineering issues
• Design trades

Midlevel IPTs
Summarize lower-level status and integrate segment-level issues

IIPTs
• Perform system-level engineering functions
• Review technical status, risk management, IPT products
• Resolve technical issues

Program Management Team
• Reviews program status, metrics, contract actions, IIPT actions, earned value issues, and midterm planning
• Resolves cost/schedule issues

Efficiency is an award-fee criteria (i.e., agenda required 24 hours in advance, minutes required 24 hours after meetings)

Integrated Data Environment

Contractor/Government Planning Cell

Project Office Round Table

Figure 2.

of Control by Harvard Business School's Robert Simons. The guiding principle of the model was that government and contractor business strategies were the central focus. The goal was maximum congruency. These strategies drove the model's four levers of control: belief systems, boundary systems, interactive control systems, and diagnostic control systems (Figure 1).

Integrating Program Management Culture

Once a management model was identified, it was critical to establish a culture that embraced a variety of new program management best practices. A great deal of effort was expended initially to demonstrate that the PM culture would pay dividends. While being fostered in small groups, change was championed by government and industry senior management. Ultimately, changes took root. Most important, best practices were integrated and strengthened. Some of the innovative best practices and enablers that PM, THAAD successfully integrated are discussed in the following paragraphs.

Extensive Collaboration

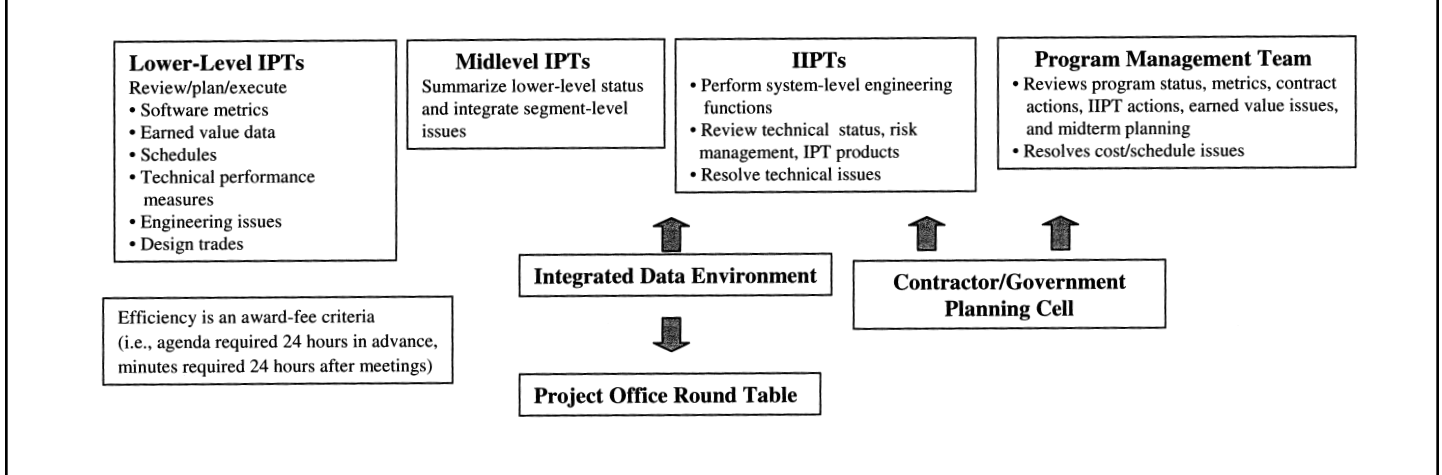The cornerstone of the THAAD management philosophy is extensive collaboration with contractors. This included reorganizing the entire project through a streamlined integrated product team (IPT) structure. This new structure was enabled by a leadership attitude that viewed contractors as partners rather than adversaries.

PM, THAAD has more than 122 IPTs with more than 3,000 participants. IPTs are not workgroups—they are comprised of participants who are empowered to speak for their organizations. By the nature of their business, IPT participants are extremely collaborative and constantly meet to discuss and resolve issues. In some cases, government and contractor personnel were specifically collocated to facilitate information sharing. In fact, one entire product office was moved into the prime contractor's facility to facilitate communication. PM, THAAD discovered that the "water-cooler conversation" and familiarity within IPTs greatly improved the exchange of ideas and, ultimately, the product. The IPT process is kept well-oiled by running quarterly training to "re-green" participants on the principles of IPTs.

Lower level IPTs review, plan, and execute software metrics, earned value

data, schedules, and engineering issues. Midlevel IPTs summarize lower level status and integrate segment-level issues. Integrating IPTs (IIPTs) perform the system-level engineering functions of resolving technical issues, reviewing risk management, and interfacing IPT products. The Program Management Team reviews program status, metrics, contract actions, IIPT actions, earned value issues, and midterm planning. It also resolves final cost schedule issues.

In addition to cultural commitment invested to build the IPT process, contract award fees reinforced the procedure by including criteria that require the contractor to publish IPT agendas 24 hours before meetings and publish minutes 24 hours after meetings. This reinforces culture while enabling better communication within individual teams.

A geographically dispersed IPT structure cannot be successful without a mechanism to assist collaboration. For PM, THAAD, the Electronic Data And Management System (EDAMS) was the solution. This application is a Web-based integrated data environment that provides nationwide coverage. Application functionality does not change based on the connection. Built to support the process, EDAMS is

data-centric with minimal graphics. It provides multilevel security to limit access to nonauthorized users. Each IPT is responsible for creating its own Web site, and data are organized by how people work. These Web sites are used primarily for workflow and archiving.

EDAMS also provides a robust Executive Support System functionality, which allows management high-level information on noteworthy metrics while allowing them to "drill down" into hundreds of detailed reports. The application is extremely intuitive, allowing new team members to contribute immediately rather than having to waste precious time training. In addition to EDAMS, the PMO also uses an internal Web-based application for government-only business. Although the transition from a paper-based to electronic culture was difficult, a sensible, intuitive solution proved to ease the changeover.

A Team Of Stakeholders

In an attempt to fully use the pool of government talent, the PM ensured that stakeholders were informed and decisively engaged in all phases of the program. In one example of this resource leveraging, the PM coordinated with the Defense Contract Management Agency (DCMA) to collocate a program integrator (PI) in the PMO. This facilitated cross talk and allowed the PM to take advantage of DCMA's considerable influence. Draft Memorandums Of Understanding (MOUs) were signed between PMO directors and local DCMA commands to outline expectations. One product of these MOUs is a weekly issue list, published by the THAAD DCMA PI, outlining all nationwide THAAD-related DCMA issues. This ultimately increased the PMO's reach by providing timely visibility into subcontractor progress nationwide.

Incentivizing Contracts

One way that a customer encourages commitment and productivity from contractors is by incentivizing contracts. PM, THAAD took this concept to a new level. The award fee is based on a total 15 percent of the contract value. Award fees are earned in 6-month contract cycles. The award emphasis can shift during each 6-month cycle based on where the project is in development. Areas of emphasis are announced before the start of a new cycle and are alpha-contracted. The contractor provides self-assessments detailing progress in the emphasized areas. The government provides the contractor with midpoint and final evaluations. The midpoint evaluation promotes dialog and refocuses stakeholders. The award fee is based on the last day of the award period rather than the performance during the entire period. This encourages the contractor to strive toward documented goals for the entire award-fee period.

The THAAD Chief Engineer chairs the Award Fee Board. This process is unique because two senior contractor managers are also present as nonvoting members. The lead DCMA commander and the Army Training and Doctrine Command Systems Manager are also invited to participate on the board. Performance input is submitted to the board by every IPT. Ultimately, the PM is the determining official. What makes PM, THAAD's contract approach so novel is the scope of the award-fee emphasis and extensive collaboration with the contractor in determining and evaluating the award. The identified award-fee emphasis ranges from the fundamental importance of missiles hitting the target to encouraging the day-to-day tasks that instill program management culture. Finally, stakeholders are involved from start to finish, ultimately building a common vision.

Review/Decision Cycle

The next tenet of the THAAD philosophy is minimizing management review/decision cycle times. To accomplish this, a review cycle was developed that would allow issues to bubble up from the lowest level IPTs to a senior management decision in less than 7 days (Figure 2). A rigorous decisionmaking process drives the collaborative environment. Tuesdays through Fridays, lower level IPTs address the status of their performance and issues, passing irresolvable issues to the next highest level. Monday mornings, the PM and directors meet for a government-only "PM round table."

Monday afternoons, the PM meets with contractor PMs on the Project Management Team to collaboratively review and resolve issues. Thursday, a government-only "technical round table" is held to ensure that government IPT participants are speaking to the contractor with one unified voice. This aggressive approach to resolve issues without letting them fester works for a few very important reasons. First, chartered members of these meetings must be able to speak and make decisions for their organizations. Second, the nonavailability of one key person does not stop the process; replacements are identified who have the background and authority to make decisions. Finally, an extensive teleconferencing capability makes these meetings possible from almost any hub in the PM's extensive IPT network.

Conclusion

This PM, THAAD case study shows that sensible implementation of program management best practices can revive a struggling program. But to be successful, these best practices must be integrated to enable and facilitate each other, and leadership must champion them. As with all change, initially, there may be resistance. The rank and file must be educated and motivated to adopt new ways of doing business that will ultimately improve the quality of the product for the soldier in the field. A positive environment that encourages new ideas and accepts change will ultimately prevail over the challenges of program management.

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BIOTECHNOLOGY FOR FUTURE ARMY APPLICATIONS

Dr. Michael R. Ladisch, Dr. James J. Valdes, and LTC Robert J. Love (USA, Ret.)

Introduction

The September 11, 2001, attacks against the United States and the spate of civilian anthrax casualties provided a painful wake-up call to the Nation. Clearly, U.S. adversaries do not need large armies or intercontinental missiles to threaten ordinary citizens, and asymmetrical warfare can potentially negate traditional military strengths. The Army's challenge is to use science and technology to consistently transform itself with the expanding spectrum of threats.

A recent study by the National Research Council Board on Army Science and Technology (NRC BAST), *Opportunities in Biotechnology for Future Army Applications*, examined ways that biotechnology can increase the combat effectiveness of future soldiers and systems. The study identified promising areas of research in sensors, materials, computing and electronics, logistics, and medicine. These pursuits have become all the more relevant in the months since the study was published.

Biotechnology has long been used to detect, identify, and track disease origins. Two critical roles for biological detection are force protection on the battlefield and the unambiguous identification of biological samples. This latter role is sometimes referred to as "bioforensics" because of its use in legal proceedings.

An example of bioforensics was the successful identification in 1993 of a mysterious pathogen that destroyed human lung tissue. The lethal pathogen, discovered in New Mexico, was traced to a hantavirus (isolated from striped field mice near the Hantaan River in South Korea in 1976) using polymerase chain reaction (PCR) technology. PCR uses DNA (deoxyribonucleic acid) to propagate, identify, and sequence viral genes from a victim's tissue. Along with other biotechnology tools, investigators use techniques similar to PCR to search for the "biological signature" of anthrax spores contained in letters sent through the U.S. mail in recent bioterrorist attacks.

Sensor Technologies

Numerous sensor technologies, based on immunoassays, nucleic acid assays, and photo-optics, use biotechnology to detect threats in the air and water. In the future, these may also be used to monitor soldiers for symptoms of exposure to harmful substances. Biochips as small as postage stamps can now perform sophisticated chemical and biological analyses on food products. A network of biosensors, perhaps integrated with field uniforms, might someday augment other sensors and intelligence sources to give commanders a more complete picture of opposing forces and provide a record of the battlefield environment.

Differences exist between Army battlefield detection requirements and commercial detection systems. To be deployable, for example, commercial biosensor systems need to be made more versatile and less reliant on biological reagents. Battlefield detection systems need to be self-contained, precise, and rugged. Other military requirements, such as miniaturization and networking of sensors, are not likely to be addressed without Army investment and encouragement.

Genomics Research

The Human Genome Project and related private efforts have paved the way for exploiting the vast amount of information coded by genes. Gene expression monitoring involves extracting data from DNA by looking at the up- and down-regulation of genes, assessing which steps in the body's metabolic pathways are affected, and correlating this information with human characteristics. Genomics research will allow drugs, dosages, and therapies to be "tailored" to individual soldiers and may lead to scientific ways to predict behavior.

Toxicogenomics, an area closely related to genomics, involves studying correlations between gene and protein expression (e.g., immune response characteristics) and reactions to toxic agents. Genes often respond to toxic insult weeks or even months before the onset of observable pathology and at exposure levels that do not produce overt symptoms.

Toxicogenomics research can provide insight on how to detect and defend against chemical and biological warfare agents as well as toxic industrial chemicals or pathogens in foreign countries where environmental protection standards are not up to those of the United States. The NRC study recommended that the Army invest in this area of military-specific genomic research as one way of leveraging commercial genomics applications as opportunities appear on the horizon. In the far term, the study predicted that the Army should lead the way toward open, disciplined use of genomics data to enhance soldier health and performance.

But other genomics applications needed by the Army may not be addressed by the biotech industry. For example, quick-response vaccine development and small-scale vaccine production capabilities are important and clearly define Army biotechnology requirements. Commercial market incentives are lacking for both, but the mission (and market) is likely to expand with homeland defense requirements to prepare for future bioterrorist contingencies. Genomics research has opened the door to new technologies for vaccine development, and the Army should support research in such areas as engineered viruses, cell-based vaccines, DNA vaccines, and monoclonal antibodies.

Army Influence

The Army will have a difficult time influencing the course of biotechnology development. For one thing, commercial research and development is focused on agriculture, medicine, and the environment, and many important Army applications are nonmedical. Also, this emerging industry consists of a diverse assortment of a few large pharmaceutical and agricultural product companies and hundreds of small entrepreneurial ventures. The industry is highly competitive in a myriad of specialty fields, including genomics, bioinformatics, microfluidics, and nanotechnology. The dollars spent by the industry on drug research and development alone far surpass that for all Army research and development, so forging multiple partnerships for influence and leverage will be essential for the Army.

Biomaterials

The NRC BAST study found that many promising biotechnologies will result from research in biological hybrid materials and biologically inspired materials. Biomaterials compatible with the human body could start the wound-healing processes on the battlefield and accelerate the repair of bones through self-replication. Innovative tissue engineering, including the use of stem cells, could repair cartilage and replace dead or damaged tissue. However, new techniques are needed to associate protein structure with function and to optimize the design of proteins through genetic engineering.

Proteins

A growing body of knowledge about proteins, known as proteomics, is leading the way toward a multitude of important applications. For example, specific proteins that can enable growth of synthetic materials on biological surfaces may resolve biocompatibility issues and facilitate the implantation of sensors, monitors, and other microscale devices. Other benefits to the Army include protein-based electronic components, lightweight armor produced from structural protein polymers, and catalytic enzymes for the degradation of toxic materials.

The focus on proteins has already led to important developments in molecular electronics for use in electronics, computing, communications,

and power systems. Protein-based computer memories provide secure and practically limitless data storage in harsh field environments. Additionally, there is strong evidence that genetically engineered proteins can be used to make electronics components immune to radiation weapons.

Biological photovoltaic cells, mimicking natural photosynthetic processes, may provide soldiers with alternatives to batteries for radios, displays, and other field equipment. Advances in agricultural biotechnology that are enabling production of multifunctional foods, such as edible vaccines, can potentially simplify logistics support for small units. However, perhaps even more important to logistics is biological research underpinning the miniaturization of systems.

Nanotechnology

Many of the top-down advances in nanotechnology have resulted from bottom-up revelations in molecular and cellular biology. Nanoscale devices consisting of cantilevers, pumps, valves, channels, and electronic components show exciting potential to conserve power, integrate external and internal sensor systems, and perform useful functions independently in transparent modes. Nanoscale structures that mimic biological functions could be used to assess physiological status (e.g., alertness) or responses to battlefield contaminants or biological threats. Other devices might combine biological or synthetic components with silicon to accomplish sensing functions not possible by any other means.

Nanotechnology is thought to have so much potential that the government committed more than $500 million to a National Nanotechnology Initiative and the Army has established a Soldier Nanotechnology Center where academic and Army scientists can work concurrently on common applications.

Other facets of biotechnology, including toxicogenomics, molecular electronics, and biologically inspired materials, are likely to have extraordinary impact on future Army operations. However, research is needed in several key areas to overcome critical barriers to nonmedical developments important to future Army applications but lacking in commercial incentives. These include investigations in target threat molecules

for battlefield sensors, improved proteins for radiation-resistant electronics, hierarchical design models for advanced combat materials, and interfaces for implanted device substructures.

Conclusion

Potential adversaries are highly likely to take advantage of developments in biotechnology to achieve dubious ends. As such, the Army must position itself to monitor the expanding fields of biotechnology, to influence developments supportive of future applications, and to exploit new opportunities as they appear.

The establishment of a new Army Biotechnology Center, which was proposed after the study was released, will be a major step toward concentrating research and monitoring commercial developments. This new multidisciplinary activity will focus on specific areas of biotechnology with important applicability to the mission needs of future Army forces and with minimal commercial interest and investment.

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DR. JAMES J. VALDES is the Army's Scientific Advisor for Biotechnology and Chief Scientist for the Army Soldier and Biological Chemical Command. He has a Ph.D. in neuroscience from Texas Christian University and has completed postdoctoral studies in neurotoxicology at Johns Hopkins University.

LTC ROBERT J. LOVE (USA, Ret.) is a Study Director on the staff of the NRC. He graduated from the U.S. Military Academy and has an M.S. in electrical engineering from the University of Arizona.

STUDENTS, ARMY ENGINEERS SHOW INGENUITY IN ROBOTICS COMPETITION

Martha McCaslin
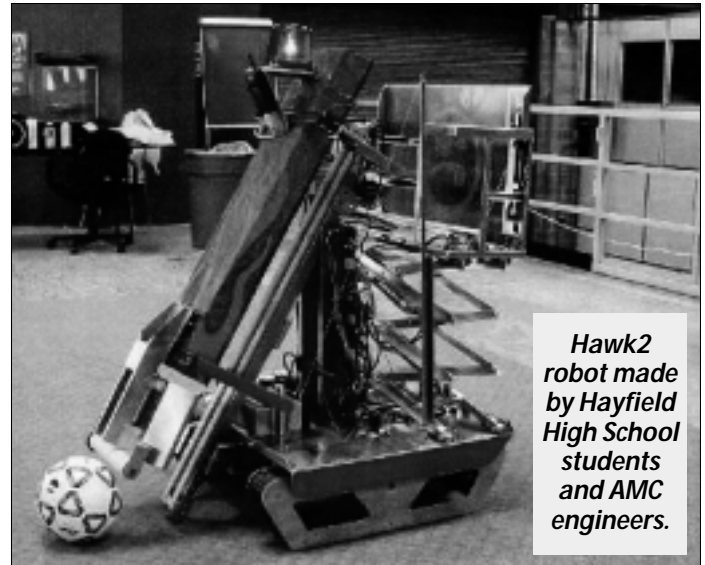
Hawk2 robot made by Hayfield High School students and AMC engineers.

There are some who might say the Army has just the right ingredients to build a robot. And, after 6 intense weeks, students from Hayfield High School in Alexandria, VA, and civilian engineers at the Army Materiel Command's (AMC's) Night Vision and Electronic Sensors Directorate did just that—they built an original robot called Hawk2.

The group sent their robot to FIRST (For Inspiration and Recognition of Science and Technology) for its annual robotics competition. FIRST is a nonprofit organization created to inspire an appreciation of science and technology in students, their schools, and their communities. Founder Dean Kamen said that kids must be shown that science and technology are fun and exciting.

The competition is designed for students and their engineering mentors to battle for honors and recognition that rewards design excellence, competitive play, sportsmanship, and high-impact partnerships between schools, businesses, and communities. The northeast regional robotics competition was held March 7-9, 2002, at Virginia Commonwealth University's Siegel Center, Richmond, VA. During the competition, the students and engineers made minor adjustments to their robot and participated in a "zone zeal" mock soccer game that measured both the robot's effectiveness and the student's collaboration and determination. The judges dubbed Hawk2 the best "picker upper" of all. In fact, it was enough to get them into the national championship competition, which was held April 25-27, 2002, at Walt Disney World's Epcot Center in Orlando, FL.

The adventure began in January 2002 when team sponsors from the northeast region traveled to New Hampshire to pick up identical robot kits and a standard set of rules. Each kit, consisting of several boxes filled with nuts, bolts, electrical wires, and instructions—everything needed to build a robot but the magic of the imagination—presented a challenge from the beginning.

Next, the students and engineers divided into teams to brainstorm, design, construct, and test their machine. Each person's job was critical to the success of the finished robot. The students learned to use sophisticated, computer-aided design programs and worked closely with the engineers; however, the students made the decisions and followed through with their ideas. For 2 hours a day for 6 weeks, including most Saturdays, the teams put their heads together to make the robot come to life.

Many of the students working on Hawk2 were "hooked" last year when their physics teacher, Mike Witte, sponsored the group. Witte is now working for the Night Vision and Electronic Sensors Directorate but continues to lead the project. Other students were attracted to the project by the enthusiasm of "veteran" students, doubling the number of interested students this year. Witte stated, "This year's robot is really neat! It's so capable!"

According to Witte, the Night Vision and Electronic Sensors Directorate is really doing a good thing for students. He said that as their teacher last year, and a volunteer leader this year, he has seen a real turnaround in some of the students. Until they signed up for the FIRST competition, most of them had never met an engineer, much less one who worked for the Army. This project has inspired students to enter the science, math, or engineering career fields. In fact, several of the students will be working at the directorate during their summer vacations.

The Night Vision and Electronic Sensors Directorate is the Army's premier organization for developing technologies that enable soldiers and pilots to shoot, move, and communicate through the night in all kinds of weather and to locate and neutralize landmines. Working with the engineers at the lab adds to the experience of designing a robot and could help these young people recognize that science and engineering are exciting and fulfilling careers they can pursue with the Army.

MARTHA MCCASLIN is a Program Integration Specialist and Public Affairs Representative in AMC's Night Vision and Electronic Sensors Directorate.

Introduction

The critical importance of software in today's high-tech world cannot be underestimated. As such, software development teams must be mindful of developing quality software on time, within budgets, and capable of meeting the customer's real needs. Despite this, however, a study by the Standish Group in 1994 reported, "A staggering 31 percent of projects will be canceled before they ever get completed, 52.7 percent of projects will cost 189 percent of their original estimates and require 222 percent more time than originally estimated, and only about 16 percent of software projects are completed on time and on budget."

The Army is certainly not immune from these results and sometimes is even more susceptible. One reason may be that DOD systems tend to be more complex and have more diverse requirements. In a recent Army project failure, the original project estimate was 18-24 months for completion at a cost of $22 million. The reality was 4 years, $70-$110 million, and the project was canceled with no delivery. The program manager (PM) noted the following as some of the reasons for the failure:

• Extremely high defect count with poor resolution trend,
• Negative combat developer feedback on system performance,
• Underestimated magnitude of the work, and
• Inadequate monitoring of daily and weekly requirements.

Inadequate requirements determination is often the cause of these abysmal results. Requirement errors are likely to be the most common

MANAGING SOFTWARE REQUIREMENTS

MAJ Joseph P. Dupont and
MAJ Robert W. Cummins Jr.

type of error and the most expensive to fix. Thus, proper software requirements definition is of the utmost importance.

Team Skills

To properly manage software requirements, the development team must possess the following six critical skills:

Team Skill 1, Analyzing The Problem. Developers must have a full understanding of the user's environment, the problem domain. This requires involvement of all stakeholders. Stakeholders can be the users, who are ultimately the soldiers; the customers, Army Training and Doctrine Command (TRADOC) System Managers (TSMs) who represent the user; materiel developers; and regulatory overseers, such as the Department of the Army and DOD. The Army is skilled in analyzing the problem and aware of its importance. In fact, DoD 5000.2-R states that contractors must be chosen partly on their appropriate domain experience. Unfortunately, because TSMs represent the user and are considered subject matter experts (SMEs), they are often mistaken for the actual user.

The concern with this is that many SMEs are not aware of the real problem. Thus, they don't address the requirements that the actual user needs.

Team Skill 2, Defining The System. User needs and the problem domain must be defined in a vision document, which is the single most important document in a software project. The vision document captures user needs, system features, and other common project requirements. It is a living document. It is not the vision provided by the TRADOC commander, which is a very high level abstraction, documented as future operational capabilities or in mission needs statements. The vision document is closely related to the operational requirements document (ORD). But what DOD calls requirements is really a definition of system features, not functional requirements. These features can be considered the system's nonfunctional requirements, those that deal with quality of service (i.e., reliability, availability, and maintainability).

Here, the Army is a master. The work involved up to writing an ORD is vast; the work involved in writing the ORD is epic. The Army spends a great deal of time ensuring the right choice to fulfill a need is a materiel one, and then we properly assign the monumental task of building it to a PM.

Team Skill 3, Understanding User Needs. This skill consists of several techniques and subskills necessary to elicit the proper requirements from the user. The developer must include all stakeholders to gain the understanding of the problem domain. The techniques are pretty straightforward: interviewing, workshops,

brainstorming, storyboarding, role-playing, prototyping, and applying use cases—a modern approach to software development. There are some great techniques, but the Army does not benefit from all of them because there is little or no training.

Team Skill 4, Managing Scope. This involves staying within budget and schedule with reasonable flexibility. Managing the scope properly means keeping requirements in perspective. For example, the Army needs to determine if the feature is really necessary or if it is just nice to have. Once a requirements baseline is established, the PM must make tough decisions to keep requirements "creep" in check. As users and customers begin to understand the solution domain (i.e., what is possible and what is available), they are going to want more.

Another important aspect of this skill is choosing the right developmental model: waterfall, spiral, or iterative. Each has value but must be applied under the right circumstances. The waterfall model (Figure 1) is normally used when a customer must have a full working version on the first drop. The drawback is that requirements must be known upfront before any work begins.

The spiral model (Figure 2) works best when time is not of the essence and there isn't a clear understanding of the requirements. It becomes a technique to help flush out the requirements by establishing baseline requirements, analyzing developmental risk, and building prototypes. Users and customers examine the prototypes and the process starts over. The drawback is that the customer doesn't receive a working product very quickly and, quite often, wants the prototype, which is not fully functional.

The iterative model (Figure 3) can be considered the best of both worlds. It employs the benefits of both to achieve a fully functional product for earlier release to the customer. The drawback here is the user only gets a subset of the required features at each release.

Team Skill 5, Refining The System Definition. This skill involves removing ambiguity in each domain. Simply documenting the definition of the domain will create as many interpretations as there are readers. Methods must be employed to specify the requirements in such a manner so there is only one interpretation. Some methods to accomplish this are through specification languages, such as the Vienna Development

Method (VDM) and Z (pronounced, Zed), through the Unified Modeling Language, pseudocode, finite state machines, and others. The features found in the ORD are ambiguous requirements. They get refined in the User's Functional Description (UFD) and the Software Requirements Specification (SRS).

The Army also does a pretty good job in this area. The UFD is the combat developer's first stab at specifying requirements and providing additional constraints, whereas the SRS is the materiel developer's first stab at alleviating ambiguity.

Team Skill 6, Building The Right System. This skill includes a multitude of techniques to keep the project on schedule and to release a product that pleases the customer. Such techniques include verifying requirements versus validating operation, requirements traceability, configuration management (CM), testing, and return on investment. A product that pleases the customer may not necessarily be the product the customer requested. It is important to provide customers a product that meets their needs; however, what they ask for and what they actually get may be two different things.

The Jury Says

To validate some of our theories, we interviewed four separate PMs and/or project leaders working in the areas of software development, software acquisition, or software systems development. The interviews were conducted using a questionnaire. All PMs we interviewed stated that the users of their system were soldiers (warfighters). They also stated that
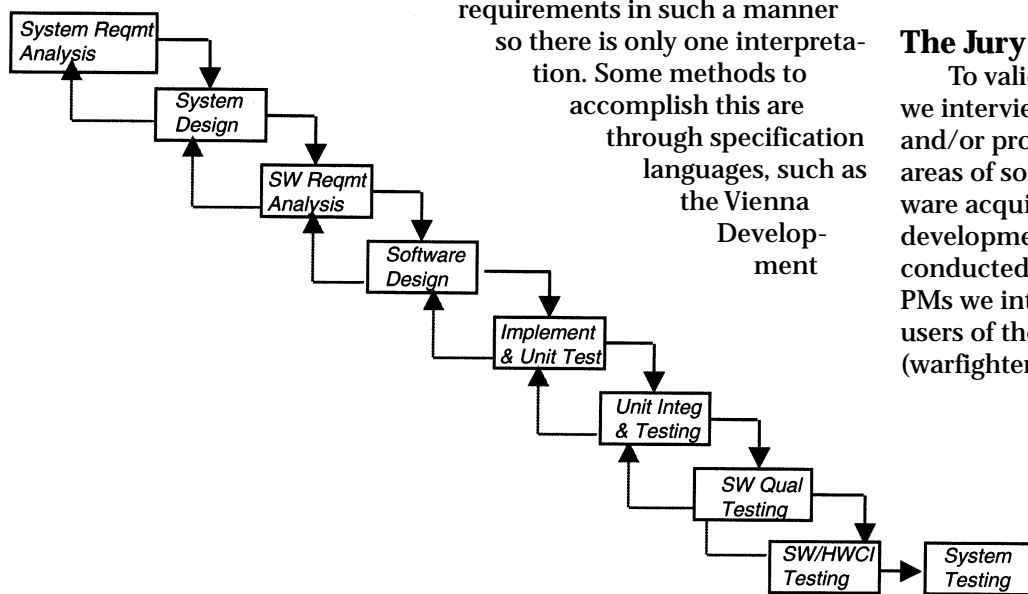

Figure 1.
Waterfall model

Cumulative Cost

Progress through steps

Determine objectives, alternatives, constraints

Evaluate alternatives; identify, resolve risk

Risk analysis

Risk analysis

Risk analysis

Risk analysis

Risk analysis

Prototype 1

Prototype 2

Prototype 3

Operational Prototype

Review

Commitment partition

Simulations, models, benchmarks

Requirements plan, life-cycle plan

Concept of Operation

Software require- ments

Software product design

Detailed design

Requirements validation

Code

Unit test

Plan next phases

Integration and test plan

Design, validation, and verification

Integration and test

Implement- ation

Acceptance test
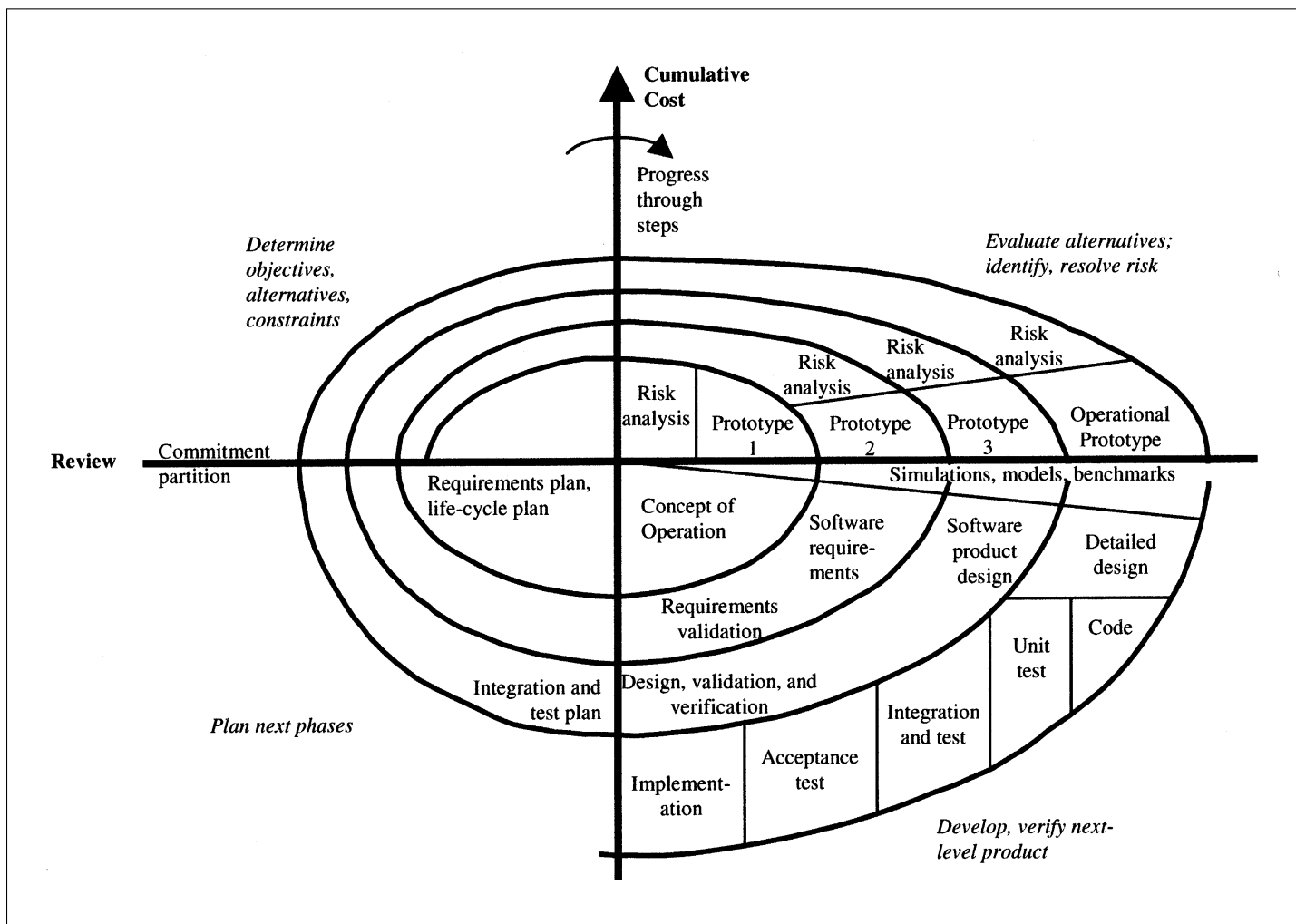
Develop, verify next- level product

Figure 2.
Spiral model

their customers were the TSMs, functional proponents (schoolhouses), or battlefield functional area (BFA) systems—further identified as the primary stakeholder. The primary stakeholder provided them with the ORD and approved the delivered functionality of their system and the system requirements. Working groups, attended by the PM, primary stakeholder, and contractors, initially discussed the preliminary design of the system in brainstorming sessions. The SRS began to take form during these sessions and was given to the contractor for initial development. Based on input from the PM, the pri-

mary stakeholder established the priority of requirements in the SRS. The group met periodically to review requirements and conduct critical design reviews to see how well the proposed system was meeting those requirements.

All PMs agreed that the primary stakeholder did not fully represent user views. They commented that they were understaffed and not trained to properly elicit user requirements. In reality, most PMs were gathering requirements from users when they were training or testing them on their system. The PMs then needed to take these

requirements back to the primary stakeholder for approval. Sometimes this was an easy undertaking, but most of the time, it required the PM to do a lot of selling of user-provided requirements.

All PMs identified contractors as their developers. Once the requirements were identified, it was up to the contractor to build the system. The contractor determined the amount of risk associated with system development and negotiated the baseline with the PM. The contractors organized, verified, and traced system requirements to ensure that the requirements were met. Some
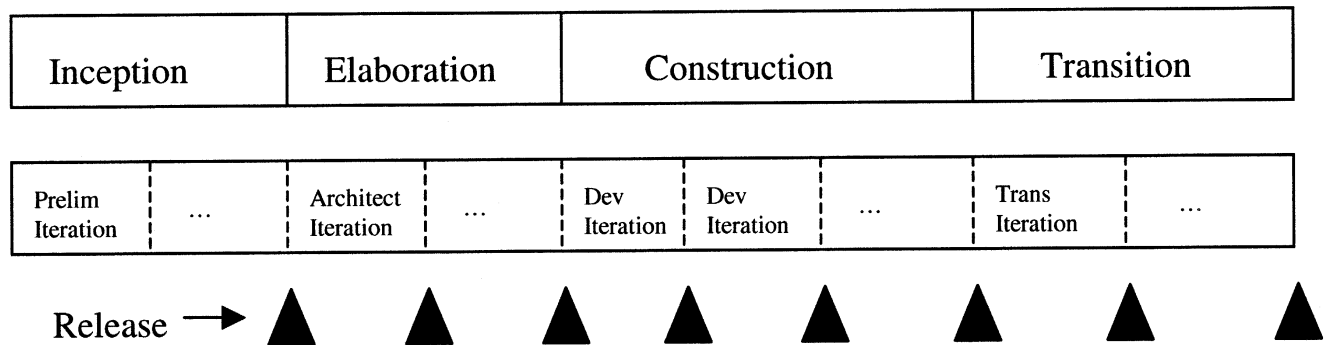
Inception	Elaboration	Construction	Transition

Prelim Iteration	...	Architect Iteration	...	Dev Iteration	Dev Iteration	...	Trans Iteration	...

Release → ▲ ▲ ▲ ▲ ▲ ▲ ▲ ▲

Figure 3.
Iterative model

PMs were unfamiliar with the contractors' CM methods, and others used various CM tools of their own to control and track the baseline. One PM office actually used an independent contractor to maintain CM.

In developing requirements, the PMs also had to contend with the regulatory overseers. All PMs identified the Office of the Assistant Secretary of the Army for Acquisition, Logistics and Technology and other staff agencies as overseers. These organizations provided specific guidance for the development of software systems. They did not send representatives to any of the working groups, but they were the review authority and provided the final approval for the system under development.

Most PMs stated that they used the spiral or iterative method in their development approach, but couldn't necessarily explain those models. It was determined that the costly method of test, fix, and test again was being used. Users were brought into the development process during training and testing. Comments were then provided to the PM, who went back to the primary stakeholder for approval, and the process started all over.

Conclusion

Users are not brought into the requirements analysis process; thus, they have no input until the system is built. This causes requirement errors that could be avoided by including the user earlier in the process. Changes after a system is built cost upwards of 50 times more than changes early during requirement analyses. Involving the user earlier in the analysis process would allow the developer to build to actual requirements and reduce feature creep and the "yes, buts." It is also important that workgroups involve all stakeholders in a productive session to help define the problem and elicit actual requirements. There are techniques to do this in our software acquisition process but they are not used. These techniques need to be used, in addition to training through practical exercises. Finally, our acquisition professionals need more education specifically on software engineering principles. Far too often there is too much reliance on the contractors' word with no understanding of software development.

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FROM THE DIRECTOR ACQUISITION SUPPORT CENTER

Summer is traditionally that time of year when moving vans are on the road and families are relocating—especially military ones. Summertime also brings many other changes, including the arrival of new people with new ideas into organizations. This is particularly true during our continuing reorganization of the Acquisition Support Center. And as I have emphasized in the past, the key element of our mission remains people: the people who are a part of this organization and the people we serve—acquisition professionals—and ultimately soldiers in the field.

Summer is also the time of year when schools recess and people graduate and begin new careers. In fact, I recently had the pleasure of meeting and personally congratulating the graduates of the Senior Service College Fellowship Program at the University of Texas at Austin. I was extremely impressed by the dedication and achievements of these Army acquisition workforce members. Among the benefits of being a member of the acquisition workforce is the ability to take advantage of numerous outstanding education and training opportunities, including continuing education and degree programs.

I encourage you to read the article on the Acquisition Career Experience (ACE) Program on Page 31. The ACE Program is an excellent opportunity for college students with multidisciplined backgrounds to work during the summer in Army acquisition organizations.

Additionally, I want to direct your attention to the "Speaking Out" article on Page 55 of this issue of *Army AL&T*, which provides some very insightful comments from several of our Army Acquisition Corps members.

Finally, I want to thank you for your many professional development questions that have been submitted for publication in the "Ask The Acquisition Support Center" article in *Army AL&T* magazine. Several of them, along with responses, appear on this page. I greatly value your suggestions and comments.

COL Mary Fuller
Director
Acquisition Support Center

Ask The Acquisition Support Center

What is the rationale behind a new directive that requires a specific number of academic business credits before an individual can become an Army Acquisition Corps (AAC) member?

To preserve the professionalism and ensure the multifunctional business acumen of our acquisition workforce, individuals accessed into the AAC are required to have 24 semester credit hours (or equivalent) from an accredited institution of higher education. These credits may be from among the following business disciplines: accounting, business, finance, contracting, economics, industrial management, law, marketing, organization management, purchasing, and quantitative methods. An alternative to this requirement is 24 semester credit hours in the individual's acquisition career field and either 12 semester credit hours from the above disciplines or training in these disciplines equivalent to 12 semester credit hours.

It is essential that our senior workforce and future leaders have the tools and skills required to effectively manage the acquisition life cycle of our soldier systems. The business education requirement is one means to broaden our workforce and maintain a sharp business sense in dealing with the multitude of customers throughout the acquisition process.

I am a military acquisition officer. How do I determine who my career manager is?

*To find this information, go to **https://www. perscomonline.army.mil/OPfam51/Staff.htm,** which lists points of contact for various topics. Career managers are listed for regions throughout the country.*

I am a Reserve/National Guard member who was just activated. Where do I go for acquisition career management guidance?

*A reservist who has been activated can call the U.S. Army Reserve Personnel Command at (314) 592-0608 or DSN 892-0608 for acquisition career management information. National Guard members should go to the AAC home page at **http://dacm.rdaisa.army.mil** and click on **Your Career Management Team,** which will give you a list of options to choose from, including **US Army National Guard Acquisition Management Branch**.*

SmartForce Now Available

SmartForce, the world's largest and most experienced e-learning company, has announced that its numerous online courses are now available to the Army, at no cost, through the Army Training Requirements and Resources System (ATRRS). Previously limited to businesses, SmartForce courses are now offered to all Active duty soldiers, Army National Guard and Army Reserve members, and Army civilian employees. Participants will have access to more than 1,500 information technology, business skills, and interpersonal skills courses from any location in the world, around the clock. Users cannot, however, apply SmartForce courses toward certification or degrees.

To use SmartForce, get an Army Knowledge Online account at **http://www.us.army.mil** and complete an ATRRS application at **https://www.atrrs.army. mil/channels/elearning/smartforce**. Be sure to browse the SmartForce Course Catalog at **https://www.atrrs. army.mil/channels/elearning/smartforce/sfCatalog.pdf** to see the courses available to you.

ACE Program Continues To Expand

The Acquisition Career Experience (ACE) Program is a paid, 2-year academic/government joint summer employment program intended to recruit full-time undergraduate college sophomores and juniors with multifunctional academic backgrounds into acquisition positions throughout the Army acquisition civilian workforce. Selected students have the opportunity to work at numerous Army organizations, are assigned a mentor for on-the-job training, and are given challenging work assignments.

Acquisition Career Managers (ACMs) from all five regions (National Capital Region (NCR), Northeast, Central, Southern, and Western) aggressively recruited highly motivated students again in 2002, resulting in more than 200 applications. Unfortunately, many of these students will be turned away because job opportunities are not yet available. Your organizations can help remedy this situation by sponsoring participants and providing financial support for the summer 2003 program. First year ACE students normally enter the program at the GS-04 level; second year students may be promoted to the GS-05 level. By sponsoring an ACE student, your organization would be responsible for salary and TDY expenses.

A central selection board was conducted in the NCR that resulted in the establishment of a Relative Standing List (a ranking of applicants' weighted scores) for each region with students from a wide variety of schools. (The article on Page 31 of this issue describes the summer 2002 review board process.) Selected students have been slated regionally against available opportunities, and official job offers are currently being extended. Some students began summer employment this past May.

ACMs from all regions will be conducting mentor workshops in an effort to guide them through the process and share insight and lessons learned from previous years. In addition to the mentor workshops, ACMs will conduct student orientations to assist the ACE students in understanding their role and responsibilities.

For additional information on the ACE Program, go to the ACE Web site at **http://dacm.rdaisa.army. mil/acepage/index.htm**.

New Program Management Career-Training Track

The Director for Acquisition Career Management, working with the Defense Acquisition University (DAU), approved a new program management career-training track, which became effective Oct. 1, 2001. This new track opens up advanced program management training to a larger portion of the acquisition workforce while at the same time provides additional focused training for acquisition category (ACAT) I/II program managers (PMs) and deputy PMs. The major training change replaces PMT 302, the Advanced Program Management Course, which is no longer offered.

The new Program Management Level III certification course is the Program Management Office Course (PMT 352). This is a hybrid course with an upfront distance-learning portion (PMT 352A) followed by 6 weeks in the classroom (PMT 352B). The prerequisites for this course are Fundamentals Of Systems Acquisition Management (ACQ 201) and Program Management Tools (PMT 250). Registration for PMT 352 is similar to other DAU courses using the ATRRS Internet Training Application System (AITAS) online registration system (**https://www.atrrs.army.mil/channels/aitas/**).

In addition, the 10-week Program Manager's Course (PMT 401), recently offered in its pilot stage, will be modified and be required for potential ACAT I/II PMs/deputy PMs (GS-14/15s or equivalent personnel demonstration broadband level, and O-5/O-6s). It is projected to be available in January 2003. The Program Manager's Course is now the prerequisite for the statutorily required Executive Program Manager's Course (PMT 402). The Program Manager's Course (PMT 401) is not required for those who have already taken the Advanced Program Management Course (PMT 302).

More information about these courses can be found on the DAU Web site at **www.dau.mil**.

FY03 COL/GS-15 PM/AC Board Results

The U.S. Total Army Personnel Command's Acquisition Management Branch recently completed an analysis of the FY03 Colonel (COL)/GS-15 Project Manager (PM) and Acquisition Command (AC) Board results for Army Acquisition Corps (AAC) officers and civilians. The following paragraphs summarize the results and indicate possible trends.

Overall Results

Board members reviewed the files of 66 AAC members (41 Active duty officers and 25 civilians). From this population, the board selected 26 principals for PM and AC assignments. The principals included 24 officers and two civilians. Results by year group (YG) for Army officers are as follows:

	YG77	YG78	YG79	YG80	YG81	YG82
Considered	1	4	5	22	8	1
Selected	0	1	1	14	7	1

Who Was Selected?

Twenty-three of the Army officers (96 percent) selected as principals were selected on their first time considered. Both of the civilian selectees were selected as principals on prior command boards. Twenty-one of the Army officers (88 percent) selected are Senior Service College (SSC) graduates. One of the two civilians selected is also an SSC graduate. Twenty-three of the officers (96 percent) selected served as lieutenant colonel (LTC) PMs or ACs. Of the civilians selected, one previously served as both a GS-14 product manager and a GS-15 project manager. The other civilian had experience as a deputy program manager at the GS-15 level.

General Observations

Officers are selected for COL PM/AC the first or second time considered after completion of SSC and successful LTC PM/AC assignments. With few exceptions, successful command is defined as at least 67 percent (two out of three) of an officer's command officer evaluation reports rated as above center of mass. Previous program office experience at the critical acquisition position level continues to be the most important combination for civilians to be competitive for PM/AC. However, there is no evidence that consecutive or repetitive program office tours better qualify an individual for PM selection. On the contrary, a very successful product management tour, coupled with successful performance in a major headquarters staff position, is a common formula for PM selection. Contracting officers require extensive con-

tracting training and experience combined with a very successful contracting command assignment. Again, success in a major headquarters staff position enhances overall file strength toward selection.

Civilians must continue to stress to their supervisors and senior raters the importance of writing meaningful comments on both performance evaluations and Senior Rater Potential Evaluations. In addition, civilians must ensure that the jobs shown on their Acquisition Career Record Brief match those shown on their résumé. Overall strength of file combined with successful performance in supervisory and managerial positions (e.g., deputy product manager) enhance chances for selection.

Summary

Because of the competitiveness for command, it is essential that AAC members pay close attention to the components of their board file to ensure accurate information is provided to board members so they can make an informed decision. The trend continues to be for command boards to select acquisition professionals with a diverse acquisition background coupled with a successful LTC/GS-14 PM/AC assignment.

FY03 COL/GS-15 PM/AC Selectees

All selectees are LTC(P) unless otherwise indicated.

Barber, Jesse L.	Hodge, Yolanda (CIV)
Bell, Anthony B.	Hogan, Thomas H.
Bliss, Gary L.	Lyford, Mark A.
Cantor, Michael E.	Maddux, Jonathan A.
Coker, David W.	McDaniels, Lloyd E.
Coppola, Alfred A. Jr.	McQuain, Paul M.
Diego-Allard, Victoria	Nichols, Camille M.
Driessnack, Charles H.	Patterson, William N.
Ernst, Adolph H. III (COL)	Payne, Jerome F.
Fritz, Gregory J.	Polcyzynski, Kennith D.
Golden, Robert (CIV)	Rust, Stephen L.
Green, Allen L. III	Smith, Michael J.
Greene, Harold J.	Stone, Jesse M.

FY03 LTC/GS-14 PM/AC Board Results

The U.S. Total Army Personnel Command's (PERSCOM's) Acquisition Management Branch (AMB) recently completed an analysis of the FY03 Product Manager (PM)/Acquisition Command (AC) Board results and overall command opportunity for Army Acquisition Corps (AAC) officers and civilians. The selection board was held Dec. 6-12, 2001, and the selection list was released April 4, 2002. The following paragraphs summarize the results and indicate possible trends.

Overall Results

Board members reviewed the files of 237 AAC members. From this population, the board selected 62 principals for PM, AC, or contracting command assignments. The selectees included 60 acquisition officers, 1 medical service officer, and 1 civilian. Of the 61 military individuals chosen, 55 are slated for PM or AC assignments, while 6 are slated for contracting command assignments. Overall selection rate was 26 percent. Military selection rate was 29 percent (61/210), and the civilian selection rate was 4 percent (1/27). Officer results by year group (YG) are as follows (not inclusive of revalidated or medical corps officers): YG87 (1), YG86 (5), YG85 (40), YG84 (9), YG83 (5), and YG82 (2).

Who Was Selected?

The civilian selectee and 31 of the 55 officers (56 percent) slated for PM or AC assignments served at least 18 months as assistant or deputy PMs. In addition, 47 of the 55 officers (84 percent) slated for PM or AC assignments served 2 years in program office, major headquarters staff, and/or executive officer assignments. Five of the six officers (83 percent) slated to be contracting commanders had at least 4 years contracting experience at either the Defense Logistics Agency, U.S. Army Materiel Command, Forces Command, or in the Office of the Assistant Secretary of the Army for Acquisition, Logistics and Technology. Ninety-eight percent of selectees have a master's degree, and two officers have a Ph.D. Five officers were not previously selected for resident Command and Staff College but have completed the nonresident course.

General Observations

Consistently strong evaluations were common among selectees. The average number of Officer Evaluation Reports (OERs) under the DA Form 67-9 was 3.5 for selectees, 4.0 for alternates, and 3.9 for officers not selected as a principal or an alternate. The average number of above-center-of-mass OERs under the DA Form 67-9 was 2.8 for selectees, 2.3 for alternates, and 1.6 for officers not selected as a principal or an alternate. The average number of center-of-mass OERs under the DA Form 67-9 was 0.7 for selectees, 1.6 for alternates, and 2.3 for officers not selected as a principal or an alternate.

The civilians selected as principals and alternates had very strong comments on their Senior Rater Potential Evaluations (SRPEs). In addition, they had previously been selected for either the Competitive Development Group Program, Senior Service College Program, or had performed duties as a deputy project/product manager. For military officers, the trend for first-look selection continues as follows:

Look	Percent Of Officers
1st	74
2nd	15
3rd	8
4th	3

For civilians, the principal and alternates were selected on their second time considered.

Summary

Before future PM/AC boards convene, it is imperative for officers to personally "scrub" their Officer Record Brief and microfiche to ensure accurate information is conveyed to board members. PERSCOM plans for officers to begin checking their files using the Army Knowledge Online Web site exclusively. Until that time, officers should continue to request a copy of their fiche at least 180 days prior to the board convening. Traditionally, the board meets in November each year. The AMB will scrub packets for officers in the zone of consideration 30-45 days prior to the date of the board. If your official photo is more than 2 years old, replace it. Prior to taking a new photo, check the awards, branch, and U.S. insignia on your uniform. Attention to detail makes a difference.

To be competitive for future selection as a PM or commander, captains and majors should seek career-broadening experiences. Officers should seek those jobs that offer experiences in program management, combat developments, testing, and contracting. With a limited number of positions in program offices, PERSCOM will continue to rotate captains and majors at approximately 24-month intervals to ensure a sufficient pool of experienced, qualified officers for future PM and command positions. Officers who want to be competitive for contracting commands should seek contracting officer positions in pre-award, post-award, and contingency contracting officer environments.

Civilians should take time to ensure that their application package is complete and contains all required documents. Special attention should be given to ensuring the data contained on the Acquisition Career Record Brief (ACRB) are accurate. Dates reflected on the ACRB should match dates shown on the résumé (e.g., dates of assignments on ACRB should match dates recorded on the résumé). "Fresh" ACRBs may be obtained from Acquisition Career Managers (ACMs) and submitted with application packages. Discrepancies such as missing evaluations should be explained. Remember, the application package reflects your career and defines your training, education, and experience to the board. Civilians must also stress to their supervisors the importance of the SRPE. Weak comments or the lack of comments may negatively impact the board's selection decision. Your ACM at PERSCOM is the best source of information with respect to board preparation.

Congratulations to the following FY03 LTC/GS-14 PM/AC selectees!

Akins, Elton LTC	Conklin, Daryl LTC
Arn, Mark LTC	Contreras, Andres LTC
Bailey, Calvin LTC	Daugherty, Anne LTC
Blackwell, Bobby LTC	Deluca, Ralph LTC
Borhauer, Rachel LTC	Dietrich, Shane MAJ(P)
Boyd, Cris LTC	Dopp, David CIV
Bristow, James LTC	Drake, Steven MAJ(P)
Bullington, Johnny LTC	Flynn, Karl LTC
Campbell, Scott MAJ(P)	Gabbert, Jeffrey MAJ(P)
Cavalier, Michael LTC	Grebe, Joseph LTC
Chandler, Michael LTC	Harvey, Christopher LTC
Chapman, James LTC	Herbert, Linda MAJ(P)
Clarke, Matthew LTC	Hodge, Tony LTC
Colvin, Darryl MAJ(P)	Holzman, Simon LTC

Horrocks, Brent MAJ(P)	Packard, Charles LTC
Iddins, Jeffrey LTC	Potts, Anthony MAJ(P)
King, Dion LTC	Ramsey, Andrew LTC
Lee, Stephen Jr. LTC	Rosso, Daniel LTC
Long, John III LTC	Ruiz, Gabriel MAJ(P)
Loper, Thomas II LTC	Shirley, Randall LTC
Mabry, Mark LTC	Silas, Lawrence MAJ(P)
McKsymick, Eric MAJ(P)	Simpson, James LTC
McRae, Lawrence LTC	Smith, Bobby LTC
Mockensturm, Jeffrey MAJ(P)	Smith, Perry LTC
Modrow, Harold III LTC	Steves, Michael MAJ(P)
Munoz, Daniel LTC	Stewart, Gregory LTC
Norris, James LTC	Surdu, John LTC
O'Donell, Warren MAJ(P)	Tarcza, Kenneth LTC
Olson, Thomas LTC	Thurgood, Neil MAJ(P)
Openshaw, Shane MAJ(P)	Tobin, Vincent LTC
Ostrowski, Paul LTC	Wendel, John MAJ(P)

U.S. Army Experimental Test Pilot Selection Board

One of the responsibilities of the U.S. Total Army Personnel Command's (PERSCOM's) Acquisition Management Branch is to manage the Army's Experimental Test Pilot Program. This 11-month program is open to Active duty Army aviators and is offered at the U.S. Naval Test Pilot School (USNTPS), Patuxent River Naval Air Station, MD.

The FY02 U.S. Army Experimental Test Pilot Training Program Selection Board, which was held Feb. 19-21, 2002, selected the following "best-qualified" commissioned and warrant officers to attend the USNTPS:

> CPT Brian Orwig
> CPT Jonathan Bulseco
> MAJ Doug Miller
> MAJ Todd Dellert
> MAJ Charles Wittges
> CW3 Donald Hunter
> CW3(P) Frank Lenander
> CW3 Terry Duquette

Commissioned officers selected for the program are automatically awarded Functional Area 51 (Research, Development and Acquisition) and accessed into the Army Acquisition Corps. Warrant officers selected for the program will continue to be managed by PERSCOM's Warrant Officer Division. There are two classes a year, one beginning in July and the other beginning the following January. Selectees may also be required to spend 12-18 months at a civilian educational institution pursuing an aeronautical engineering degree prior to entering USNTPS.

After successfully completing the USNTPS Program, graduates are assigned to initial utilization tours as experimental test pilots at the U.S. Army Aviation Technical Test Center, Fort Rucker, AL. Subsequent assignments are consistent with the officer's designated functional area specialty and the needs of the Army. Officers in research, development, and acquisition positions may serve as experimental test pilots or in positions affecting the type, design, and configuration of Army aircraft. Because of the high-dollar investment in training experimental test pilots, the Army closely monitors their subsequent assignments and professional development.

This year's board selection process was highly competitive. Anyone interested in applying for consideration by next year's selection board should review the information below. Board members will thoroughly review all aspects of an application packet, and the following are particular focus areas.

Academic Background

The academic program at the USNTPS is extremely rigorous and challenging, given the simultaneous demands of academics as well as a flight syllabus and report writing. Accordingly, applicants should possess a strong background in mathematics, engineering, and other related courses, with above-average grades. Applicants should ensure that these courses are annotated on official transcripts from the academic institution. If a course was taken that may qualify for equivalency, supporting documentation should be included in the packet.

At a minimum, warrant officers are required to have completed college algebra, calculus, differential equations, and physics (or mechanics). Commissioned officers are required to have a bachelor's degree in engineering or a hard science. Highly desired courses include structures, solids, statics, thermo and fluid dynamics, aerodynamics, stability and control theory, and advanced mathematics.

Overall, the academic performance in all areas, as well as cumulative grade point average, is considered when assessing an applicant's ability to complete the stringent academic requirements of the USNTPS Program. This year's board revealed that many warrant officer applicants were missing one or more of the required courses. Additionally, many applicants had completed academic courses in areas that were general in nature or had no relevancy to the disciplines needed to successfully complete the USNTPS.

Flight Hours

The minimum flight requirements are 700 hours for commissioned officers and 1,000 hours for warrant officers. DA Form 759-E, *Individual Flight Record and Flight Certification-Army*, will be reviewed in detail to determine the scope of the applicant's flight experience. Emphasis is placed on operational flight hours versus time accrued in a simulator. Pilot-in-command time is weighed heavily as an indicator of aviation experience and maturity. Ratings as an instructor pilot (IP), instrument flight examiner, and maintenance test pilot are also viewed favorably. Civilian fixed-wing ratings and training are viewed favorably as well and should be documented. However, civilian flight hours do not count toward the minimum flight-hour requirement.

Endorsements

Applicants should include letters of recommendation from an IP/standardization instructor pilot (SIP) documenting their flying abilities and potential. Applicants should ensure that the IP/SIP endorsements are current. Other endorsements may be included within the packet and will be given due consideration.

Chain Of Command

Application packets require endorsements by the officer's chain of command through the O-6 level. This is to keep the chain of command informed and will preclude conflict with the programming of a candidate for the required training prior to attending USNTPS. Officers in advanced civil schooling should also use their current chain of command through the O-6 level. The endorsement can be routed through the chain of command on the application memorandum or be included under separate cover.

Time On Station

This year's board-selected officers will attend either USNTPS Class 125 (July 2003 to June 2004) or Class 126 (January 2004 to December 2004). Officers are required to have at least 1 year time on station per the board message. This allows the officer to attend the USNTPS in one of the above classes while fulfilling a minimum of 2 years time on station within their current assignment. For next year's board, applicants must have at least 12 months time on station by February 2003. Students in advanced civil schooling are exempt from this requirement.

Next year's USNTPS board is tentatively scheduled for February 2003. Interested applicants should review the appropriate MILPER message (to be released around October 2002) to verify they meet the minimum requirements. Commissioned officers interested in applying for the program should contact MAJ Jeff Bochonok at (703) 325-2800/DSN 221-2800 or e-mail **jeffrey.bochonok@ hoffman.army.mil**. Warrant officers should contact CW3 Kim Young at (703) 325-5251/DSN 221-5251 or e-mail **kim.young@hoffman.army.mil**.

FY04 Congressional Fellowship Program

HQDA has announced that the FY04 Congressional Fellowship Program will be conducted August 2003-November 2004. This program offers top Army officers an outstanding opportunity to receive valuable training and experience by serving as staff assistants to members of Congress. Fellows are typically given responsibility for drafting legislation, arranging congressional hearings, writing speeches and floor statements, and briefing congressional members for committee deliberations and floor debates.

The U.S. Total Army Personnel Command's (PERSCOM's) Acquisition Management Branch (AMB) will convene a review board in September 2002 to nominate Army Acquisition Corps officers for the program. On Dec. 3, 2002, the Army Congressional Fellowship Selection Board will review the list of nominees and make final selections.

To be eligible for the program, officers must meet the following criteria:

• Hold the rank of major or lieutenant colonel with no more than 17 years Active federal commissioned service as of Jan. 1, 2003;

CAREER DEVELOPMENT UPDATE

• Be a graduate of Command and General Staff College (resident or nonresident);

• Be branch qualified at current rank;

• Meet height and weight requirements per Army Regulation (AR) 600-9, *The Army Weight Program*;

• Have no adverse actions pending;

• Not be competing for any other sponsored program, fellowship, or scholarship;

• Be available for a utilization tour immediately following the fellowship; and

• Have potential for future military service.

The Congressional Fellowship Program begins with an August-December 2003 HQDA orientation and attendance at the Force Integration Course and a variety of meetings and seminars. Following the orientation period, fellows serve as staff assistants to members of Congress from January-November 2004. After complet-ing the program, officers will incur an Active duty Service obligation of no less than three times the length of the fellowship (per AR 350-100) and then serve a 2-year utilization assignment in a position that requires knowledge of congressional activities.

To apply for the FY04 Congressional Fellowship Program, officers should complete DA Form 4187, *Personnel Action*. The form must be approved and signed by the individual's field grade supervisor or equivalent and forwarded by Sept. 6, 2002, to PERSCOM, ATTN: TAPC-OPB-E (Paula Bettes), 200 Stovall Street, Alexandria, VA 22332-0411.

Additional information on the Congressional Fellowship Program is available on AMB's Web site at **http://www.perscom.army.mil/opfam51/ambmain.htm** or on the Office, Chief Legislative Liaison Web site at **http://www.hqda.army.mil/ocll**.

IMPORTANT NOTICE

If you are an individual who receives *Army AL&T* magazine and you have changed your mailing address, do not contact the *Army AL&T* Editorial Office! **We cannot make address changes regarding distribution of the magazine.** Please note the following procedures if you need to change your mailing address:

• Civilian members of the Army acquisition workforce must submit address changes to their Civilian Personnel Advisory Center (CPAC).

• Active duty military personnel must submit address changes to their Military Personnel Office (MILPO).

• Army Reserve personnel must submit address changes to the U.S. Army Reserve Personnel Command (ARPERSCOM) in St. Louis, MO.

• National Guard personnel must submit address changes to the Army National Guard Acquisition Career Management Branch at **acmb@ngb.army.mil** or call DSN 327-7532/9073 or (703) 607-7532/9073.

Your attention to these procedures will ensure timely mailing of your magazine.

A&TWF Newsletter Online Only

Starting with the summer 2002 issue, *The A&TWF Newsletter* will only be available to readers through the Army Acquisition Corps home page. In these times of change and consolidation, the Acquisition Support Center (ASC) is striving to be smarter about resource allocation while maintaining our commitment to you, the acquisition professional. We remain dedicated to bringing you the career development information you need in a timely manner so you can effectively manage your career. *The A&TWF Newsletter* will still feature the important career-related information you've come to expect. To access the newsletter, go to **http://dacm.rdaisa.army.mil/** and click on *The A&TWF Newsletter* icon. If you have any questions or feedback, please contact Cindy Stark, an SAIC employee assigned to the ASC, at (703) 604-7123, DSN 664-7123, **Cindy.Stark@saalt. army.mil**.

The Certified Quality Manager Handbook, Second Edition

By Duke Okes and Russell T. Westcott
Quality Press, 2001

Reviewed by LTC Kenneth H. Rose (USA, Ret.), PMP, a Project Management Instructor for ESI International residing in Hampton, VA, and former member of the Army Acquisition Corps.

Recent project management literature and project managers themselves increasingly recognize a *quadruple* constraint of project management: cost, schedule, technical performance, and quality. Project managers are generally well-schooled in the traditional first three. Quality can be a new challenge. *The Certified Quality Manager Handbook, Second Edition* by Duke Okes and Russell T. Westcott provides a complete resource for the busy project manager looking for substance without encumbering detail.

The description above, "without encumbering detail," should not be taken negatively. This text is by no means a superficial overview. It is exactly what project managers need—a means for developing quality literacy that will enable them to understand, evaluate, and affect the quality components of their projects.

The Quality Management Division of the American Society for Quality (ASQ) produced the book as a guide in preparing for the ASQ Certified Quality Manager examination. It is a rich resource of management-level quality information that is ideally suited to the needs of a project manager. It comprises a comprehensive collection of executive summaries across the full spectrum of the quality management body of knowledge, including leadership, strategy development and deployment, quality management tools, customer-focused organizations, supplier performance, management, and training/development.

One note of caution: a project manager should not skim this book and then announce with confidence, "Now I are one." A project of substantial size would probably benefit from a designated quality manager—a quality professional with expertise and fluency in details who can perform the project's necessary day-to-day, hands-on quality tasks.

The book is organized in a two-tier system of sections (body of knowledge elements) and chapters (components of each element). Each chapter begins with bulleted lists describing how the chapter will help the reader and what the chapter will discuss. Each chapter closes with endnotes and suggestions for further reading. Documentation and references are substantial throughout.

Three sections are of immediate interest to project managers. The leadership section consisting of two chapters appears first and establishes the foundation for following material. Quality begins at the top and succeeds only through top-management support. The evolving definition of quality recognizes the difference between what Dr. Joseph Juran [a writer and lecturer on the topics of quality planning and control] calls *little-q* (product quality) and *big-Q* (organizational process quality). Nowadays, the focus is on big-Q with little-q as a component. The leadership section also addresses the basics of organization design, organization change, negotiation, conflict resolution, and team building.

The management section includes chapters on principles, communication, projects, quality systems, and quality models. The discussion of projects will seem a bit thin to experienced project managers. Perhaps this is an area in which project management professionals might contribute to the expertise enhancement of quality professionals. The discussion of quality systems and models should be illuminating to project managers. Both are essential to understanding and embracing quality as a key element of project success, not just another "thing to do."

The section on quality tools gets down to nitty-gritty, how-to information that will arm a project manager to act on quality, not merely know about it. It includes the classic seven tools of quality control as well as the newer seven management and planning tools. All are useful in leading and controlling project performance. The discussion of process management is complete and well-supported by clarifying graphics. The chapter on measurement is written for understanding, not show, and clearly describes complex concepts related to statistics, capability, and benchmarking.

Readers should move next to sections on customer-focused organizations and supplier performance as areas of project-related interest. Jan Carlzon's *Moment of Truth*—"any episode in which the customer comes in contact with any aspect of the organization and gets an impression of the quality of its service"—should be an eye-opener for project managers who tend to focus mostly on technical aspects of their project. And, in many large projects, supplier quality is critical to project quality and should be the basis for subcontract award, not price alone.

Finally, a perusal of the strategy development/deployment and training/development sections will complete the tour of the quality management community. Both areas will probably be familiar to project managers, easing the assimilation of quality contexts.

Project managers cannot and must not do everything. They must hire good people and then effectively delegate to gets things done well, on time, and within

budget. As mentioned earlier, quality is gaining recognition as a fourth and essential constraint. *The Certified Quality Manager Handbook, Second Edition* provides the information necessary to manage this constraint. It should be a project manager's first stop on the personal education path and kept close at hand as a guide along the project performance trail.

This book is available from the Project Management Institute bookstore at **http://www.pmibookstore.org**.

The 7 Levels of Change: The Guide to Innovation in the World's Largest Corporations
By Rolf Smith
The Summit Publishing Group,
Arlington, TX, 1997

Reviewed by LTC John Lesko (U.S. Army Reserve), a Decision Coach and Group Facilitator with Anteon Corp. He is a member of the Army Acquisition Corps and a frequent contributor to Army AL&T. He can be contacted at John.Lesko@saftas.com.

In this era of transformation, what better topic is there to study and discuss than change?

At first glance, *The 7 Levels of Change: The Guide to Innovation in the World's Largest Corporations* appears as nothing more than a compilation of the author's favorite briefings, lecture notes, or corporate "war stories" drawn from a client list that includes a number of Fortune 500 companies. A second look confirms that this book is truly different. For example:

• In the lower left page margins of the book, the reader will find copies of slides that the author has developed for use in his so-called thinking expeditions.
• Next comes a seven-page overview of the book's main ideas.
• Each chapter starts with a "mind map" or graphic outline of that chapter's contents.
• There is a liberal use of annotations in the margins printed to look like handwritten notes or drawings.

Yet another clever idea, which some might dare to call an innovation, comes in the form of a bright yellow bookmark that is included with the text. On one side, this marker lists strategies for making professional change at work; on the other side appears strategies for

personal changes that one might make at home. But this book is not just a collection of gimmicks and/or cheap facilitator tricks.

The author and the book's many contributors—listed in the acknowledgments section and cited graciously throughout—have done a good job at structuring this guide so that the reader doesn't have to start at the beginning and read straight through to understand or apply its lessons. Creative design and editing make this book a useful desk-side reference.

The titles of each chapter follow:

• Innovate or Die!
• The Magic Number 7
• Level 1: Effectiveness – Doing the right things
• Level 2: Efficiency – Doing the right things right
• Level 3: Improving – Doing things better
• Level 4: Cutting – Doing away with things
• Level 5: Copying – Doing things other people are doing
• Level 6: Different – Doing things no one else is doing
• Level 7: Impossible – Doing things that can't be done
• What's Next?
• Getting Ready for Change

In the book's main body, Smith describes the essence of each type of change, noting that no one type is any better than the others but merely different. In the back matter, Smith provides plenty of complementary material in the form of case studies, self-assessment exercises, and reference materials. Of particular interest to the readership of *Army AL&T* might be the case study on the U.S. Navy's SMART Ship Project, USS Yorktown.

The 7 Levels of Change: The Guide to Innovation in the World's Largest Corporations is a book for all members of the Defense acquisition, logistics, and technology communities. This book is much more than a think piece or a treatise from some ivory tower or business school printing press. *The 7 Levels of Change: The Guide to Innovation in the World's Largest Corporations* contains both theoretical and practical advice for anyone faced with the management of organizational change. It is a guidebook that promises to deliver results and, in the opinion of this reviewer, Smith delivers on his promise. It is a must-read for those who wish to master change versus having change master them.

Besson Awards Recognize Procurement Excellence

At a recent U.S. Army Materiel Command (AMC) conference in Gulfport, MS, Harold F. Kershaw, MAJ Scott C. Dolloff, and Michael P. Farrell received the 2001 Frank S. Besson Award for Procurement Excellence. Sallie H. Flavin, AMC's Assistant Deputy Chief of Staff for Research, Development and Acquisition-Acquisition, Contracting and Program Management, presented the awards.

The prestigious Besson Award was established in honor of GEN Frank S. Besson, the first AMC Commander, and his lifelong achievements in acquisition. The award recognizes individual excellence in the AMC contracting workforce. Selection is based on demonstrated technical expertise and development and implementation of innovative procurement-related processes in support of AMC's mission. Awards are made annually to recognize exceptional achievements by three individuals assigned to AMC—a civilian careerist, a military officer, and an intern.

Harold F. Kershaw, a Price Analyst and Contract Pricing Advisor for the Office of the Program Manager, Saudi Arabian National Guard Modernization Program (OPM-SANG) in Riyadh, Kingdom of Saudi Arabia, is the civilian careerist recipient of the 2001 Besson Award. Kershaw was recognized for developing the first cost-evaluation model and software for use by the Saudi Arabian National Guard to streamline the cost-evaluation process and provide a database for proposal evaluations. This monumental development project required Ker-

shaw to conduct a multinational, countrywide compensation review to determine labor categories and costs for labor benchmarks. The model will shorten the review process from 6 to 3 weeks and dramatically reduce the required manpower.

Kershaw also worked closely with the Saudi Arabian National Guard's Chief Financial Officer and briefed the Saudi Arabian National Guard's senior leadership on various procedures employed by the OPM-SANG staff to control contract costs. Now with the Defense Contract Audit Agency's Greater Connecticut Branch Office, Kershaw has earned numerous other awards during his more than 30 years of combined military and civilian service. He is Level III certified in auditing, holds both undergraduate and graduate degrees, and is a certified public accountant.

MAJ Scott C. Dolloff was honored for his efforts while on special assignment as a Contract Specialist in support of the Army Airborne Command and Control System (A2C2S) source selection on behalf of the U.S. Army Aviation and Missile Command (AMCOM) Acquisition Center, Redstone Arsenal, AL. Among Dolloff's many contributions to the success of the A2C2S Program were his expertise and aggressive leadership in the development of the A2C2S requirements package and solicitation, and his writing, staffing, and obtaining approval of both the acquisition plan and source selection plan. These plans were important to the program, and their approval cleared the way for issuance of the Request For Proposal (RFP).

Dolloff's tireless efforts and mission focus enabled him to develop and release the competitive A2C2S RFP in less than 90 days after beginning his assignment.

Pictured (left to right) are Sallie Flavin; Marlene Cruz, Principal Assistant Responsible for Contracting (PARC), AMCOM; MAJ Scott C. Dolloff; Harold F. Kershaw; Michael P. Farrell; Edward Elgart, CECOM PARC; and Vick White, OPM-SANG PARC. PARCs make the nominations for the Besson Award.

Dolloff has served in a variety of contracting and program management positions since becoming a member of the Army Acquisition Corps in 1990. He is Level III certified in both disciplines, holds undergraduate and advanced degrees, and is a Certified Professional Contract Manager and a member of the National Contract Management Association (NCMA).

Michael P. Farrell was commended for his work as an Acquisition Intern for the U.S. Army Communications-Electronics Command (CECOM), Fort Monmouth, NJ. During assignments at both the Fort Monmouth and Alexandria, VA, CECOM Acquisition Centers, Farrell demonstrated his exceptional skills through successes on projects typically reserved for senior employees. His potential was recognized at the outset of his career when he received the Department of the Army Achievement Medal for Civilian Service.

Farrell's work on the All Source Analysis System-Light (ASAS-L) acquisition is just one example of his ability to work at levels beyond those expected of an intern. His extensive market research and efforts to timely solicit, negotiate, and execute $15.6 million worth of sole-source task orders enabled the successful fielding of the ASAS-L on schedule. Farrell also made valuable contributions as a team member on one of the most complex acquisitions being conducted by the Alexandria center—the Defense Travel System contract. Farrell holds an undergraduate degree with honors, is Level II certified in contracting, is a member of NCMA, and is pursuing an M.B.A. degree.

Each October, AMC requests nominations for the Besson Award. Procedural guidance for the award is contained in AMC Regulation 672-10 and can be accessed at **http://www.amc.army.mil/amc/rda/rda-ac/besson01/besson-award-01.htm**. For additional information, please contact Scott Crosson at (703) 617-0544 or **scrosson@hqamc.army.mil**.

NEWS BRIEFS

Keeping Emergency Responders Cool

A new personal cooling system for emergency responders working in encapsulated protective suits is the goal of a Cooperative Research and Development Agreement between the U.S. Army Soldier Systems Center (Natick) and the Oklahoma City National Memorial Institute for the Prevention of Terrorism (MIPT). The MIPT is a nonprofit organization that sponsors research on equipment, training, and procedures to help first responders prevent and respond to terrorism. The institute and an Oklahoma State University team are partnering with Natick to improve protective clothing for police officers, firefighters, and medical personnel who respond to terrorist incidents. The 3-year, $3 million project will involve the design and construction of a personal cooling system for work in areas affected by chemical, biological, or nuclear weapons. The objective is a wearable cooling system that will reduce the effects of heat stress on emergency responder performance.

MIPT Director GEN Dennis Reimer (USA, Ret.) said he knew about Natick's facilities for designing and testing military protective equipment. After some correspondence, he became "convinced" that the facility has the know-how that can be transferred to the first responder community. "We at MIPT are extremely pleased to be associated with the professionals at Natick, and at our first year-in-progress review, we saw how much we were able to leverage the experience and expertise of the Soldier Systems Center," Reimer said.

Some commercial personal cooling garments use ice pack inserts, which cool unevenly. Under this MIPT Program, a new technology called adsorptive carbon-based cooling will be developed to solve these types of problems. "Adsorptive carbon-based cooling is something we're aware of, but we haven't done research and development on it," said Bill Haskell, Technical Program Development Manager for the National Protection Center at Natick. "This project is investigating a technology the Army could leverage for future warrior systems."

The portable, integrated cooling system will include a liquid-circulating garment developed at Natick and will be powered by a battery for a 1-hour mission. A prototype cooling system is scheduled to be ready by April 2003. Natick is part of the U.S. Army Soldier and Biological Chemical Command (SBCCOM). For more information about SBCCOM or the Soldier Systems Center (Natick), go to **http://www.sbccom.army.mil**.

AMRICD Poster Takes Top Honors

Best poster honors in the In Vitro Toxicology Session of 2002's Society of Toxicology (SOT) national meeting in Nashville, TN, went to Dr. James Dillman III and his co-authors Kriston McGary, James Clark, Catherine Braue, and Dr. John Schlager. The winners are all employed in the U.S. Army Medical Research Institute of Chemical Defense's (AMRICD's) Applied Pharmacology Branch, and the poster, "Upregulation of Cytokine Release by Sulfur Mustard Exposure is Mediated by the p38 MAP Kinase Signaling Pathways," was one of more than 30 presented during the session. Dillman accepted the award on March 18, the opening day of the SOT meeting.

Since 1999, Dillman has worked at AMRICD as a National Research Council Research Fellow under the mentorship of Schlager. Dillman has focused his research efforts on proteomics to define the molecular and cellular consequences of chemical warfare agent exposure to identify potential prophylactic and therapeutic targets for further research and development.

According to AMRICD Commander COL James A. Romano, "Dr. Dillman is an expert practitioner of proteomics, the study of protein properties to obtain an integrated view of disease and injury processes. His award, given by the Society of Toxicology, validates the scientific worthiness of his approach. Ultimately, these technologies will enable us to better identify molecular targets for development of chemical warfare agent countermeasures. We are very proud of Dr. Dillman's accomplishments."

Dillman received his B.S. in biology from Lebanon Valley College of Pennsylvania and his Ph.D. from the University of Virginia where he studied molecular motors in the nervous system. Before joining AMRICD, he held a postdoctoral fellowship in the Department of Neurology at Johns Hopkins University School of Medicine where he studied the molecular pathogenesis of stroke and neuronal degeneration. He has authored or coauthored more than 30 peer-reviewed articles, book chapters, and abstracts.

Army Contracting Metrics Show Continued Progress

The FY01 Procurement Statistical Reports and *Summary of Procurement Actions* have been published, and the Army has completed its annual progress reports. The results will be posted on the Web at **http://acqnet.saalt.army.mil/acqref/armetrc.htm**.

By examining historical data, conducting ratio analyses, and assessing the overall trends, the Army can reach important conclusions about the health of its contracting mission and the impact of Army acquisition reform. One key measurement tool in use since 1995 is the cost-to-purchase metric. This metric provides the cost expended (in cents) to purchase one dollar's worth of supplies or services. During the analysis period from FY95 through FY01, the cost-to-purchase metric decreased from 1.42 cents in FY95 to 1.09 cents in FY01, a decrease of 23 percent.

The average annual obligation per person increased from $3.3 million in FY95 to $7.5 million in FY01, an increase of 227 percent. This metric, the average dollar awarded per person per year, indicates that the average Army contracting professional has become significantly more productive in terms of total output. This productivity increase is attributed to a variety of factors including significant personnel reductions, process improvements, and acquisition reform initiatives.

A third metric that increased dramatically was the average obligation per contracting action. This metric rose from $14,400 in FY95 to $109,418 in FY01, an increase of more than 760 percent. This increase reflects the use of government purchase cards for micropurchase needs, as well as the continuing emphasis on consolidating contract requirements where possible and useful.

*For additional information, contact Monti Jaggers at (703) 681-7571 or **monteze.jaggers@saalt.army.mil***.

O'Connor Takes Over As COE R&D Director

Dr. Michael J. O'Connor, former Director of the U.S. Army Engineer Research and Development Center's (ERDC's) Geotechnical and Structures Laboratory, Vicksburg, MS, has assumed new duties as the Director of Research and Development, U.S. Army Corps of Engineers. He succeeds Dr. Lewis E. Link Jr., who has retired.

O'Connor's previous positions include Director of ERDC's Construction Engineering Research Laboratory (CERL), Champaign, IL; Technical Director, CERL; and Chief of CERL's Infrastructure Laboratory.

O'Connor is the recipient of numerous honors and awards, including the Army Engineer Association DeFleury Medal (Silver Order) and the 2000 Equal Employment Opportunity Award. He holds bachelor's and master's degrees in industrial engineering and a doctorate in mechanical engineering from the University of Illinois at Urbana-Champaign.

The author of more than 30 technical papers and reports, O'Connor is a member of the Tau Beta Pi National Engineering Honor Society and the Honor Society of Phi Kappa Phi. In addition, he is a member of the Construction Research Council and the Awards Committee of the Construction Division of the American Society of Civil Engineers.

How would you describe your experience in the Army Acquisition Corps and what suggestions do you have for improving the program?

COL William M. Gavora
Former Project Manager
Aviation Systems
Program Executive Office
Aviation
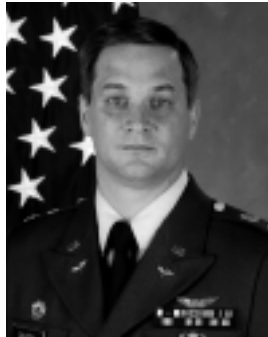
I have been a member of the AAC since its inception and believe that the Congress was correct when it required the Services to establish professional acquisition programs with specific training, education, and experience standards prior to service in positions designated as critical. By and large, the system has worked well and as expected. The AAC has made great strides in the development and utilization of civil servants; however, the main deficiency, in my view, is the lack of a credible plan on the utilization of former civilian PMs [program, project, and product managers].

LTC Scott E. Shifrin
Product Manager
Stinger Missiles and Platforms
Short Range Air Defense Project Office
Program Executive Office (PEO)
Air and Missile Defense

My acquisition experiences have been very rewarding as I was blessed with a significant number of "grooming" assignments working in a variety of different PEOs, joint assignments, and at HQDA. I have gained many different perspectives, insights, and experiences regarding "the art of acquisition" as viewed from different organizations and levels of command. These developmental acquisition assignments centered on learning about the acquisition process (the model); understanding the bureaucracy, regulations, and acquisition methodology; and how the Army really operates at the HQDA level. In general, I believe the acquisition community is taught to operate within the bounds of the regulations and to maintain the "status quo."

I believe the members of the Army Acquisition Corps (AAC) have a significant opportunity to be at the forefront of transformation and provide premier leadership to the Army and make a real difference on the battlefield and in the lives of the soldiers we support. To accomplish this, both civilian and military AAC members must lead from the front and create an atmosphere that tolerates and promotes new and more efficient ways of doing business. The way we operated in the past is no longer good enough. A majority of today's programs are time- and resource-constrained and require nontraditional solutions, with acquisition leaders who are relentless in challenging the current process. We must groom our future AAC leaders to become risk takers, bold and aggressive, solving difficult problems using "out-of-the-box" solutions. We must use the Army transformation process as the catalyst to seize the initiative and challenge the status quo. We are no different from the regular Army. We, as a community, are expected to police our own, set high standards, and provide an atmosphere for nontraditional solutions and problem solving. I would not trade my experiences in the Acquisition Corps, nor would I trade the military experience and leadership opportunities I gained while part of the Army prior to entering the Acquisition Corps.

MAJ William M. Boruff
Executive Officer
Acquisition Support Center

To date, the Army Acquisition Corps has been a challenging and rewarding way of life. I was accessed in 1995 following 2 years of command in the 101st Airborne (Air Assault). My first assignment was at Fort Bragg, NC, as a Contingency Contracting Officer (CCO). I became a CCO team member who prepared for worldwide deployments within 24 hours

notice. Within 10 months I had earned my warrant and was an active member of one of the three CCO teams.

At about my 1-year point, I was given the opportunity to deploy to United States Support Group-Haiti (USSG-Haiti) to serve as the Chief of Contracting. This was an extremely exciting and challenging assignment working in a joint contracting environment for a Marine Commander and Deputy Commander. Members of the construction team on the ground were Navy Seabees, and our office consisted of Army and Air Force contracting officers. The contracting missions on the ground became very interesting as we worked through interpreters to ensure the specifications the customers ordered were met to standard. The missions stayed constant throughout my 179-day tour from November 1996 through April 1997. One of the most interesting experiences of this tour was a contract termination. The contractor had not met the desired delivery dates and USSG-Haiti could not get behind on construction tables. In this type of sensitive diplomatic contractor base, the balance of providing a fair termination to the contractor while ensuring USSG-Haiti received fair compensation was very exciting. I can clearly say that the contracting officers who had the opportunity to work those negotiations learned valuable lessons that have made them better officers.

Upon completion of my tour at Fort Bragg, I attended a fully funded master's program, which is a wonderful opportunity for Army Acquisition Corps members. As such, I would encourage interested officers to apply.

My suggestion to improve the Army Acquisition Corps is for the Army to increase awareness of all the great services the Acquisition Corps provides the Army as a whole. These services range from contingency contracting support to the new weapons and other systems provided to the field to ensure our Army remains the most elite army in the world. The Army Acquisition Corps is clearly a force multiplier because of all the professional support we provide. The bottom line is for the Army in general to better understand what the Army Acquisition Corps provides—outstanding support and systems!

Mary McHale
Acquisition Proponency Officer
Acquisition Support Center

As a well-known credit card company boasts, "Membership has its privileges." My membership in the Army Acquisition Corps (AAC) has helped me achieve certain personal career objectives that I otherwise would

not have been able to secure. As a member of the AAC, I applied and was selected for the AAC's Long Term Training (LTT) Program, which enabled me to complete my master's degree during duty hours. The LTT Program reduced some of the stress associated with working full time, attending graduate school, and rearing an active family. Since graduating and returning to my current position in the Acquisition Support Center, I have been able to apply what I learned in school. Additionally, the Defense Acquisition University training I have received since the 1991 implementation of the Defense Acquisition Workforce Improvement Act has enabled me to broaden my knowledge and interest in both my primary and other acquisition career fields (ACFs). Through participation in continuous learning activities, I have been able to maintain currency in my primary ACF, participate in various leadership opportunities, and further develop myself professionally. These activities, coupled with the diverse acquisition assignments that I have been afforded, have helped me grow into a professional acquisition manager who is well-equipped to support the current and future acquisition challenges of our warfighters. With the privileges of membership come certain obligations. I view these as challenges that I am honored to meet.

The AAC offers many other career development opportunities (education, training, and experience) to its military and civilian workforce. Initiatives such as the Competitive Development Group Program help eliminate some of the traditional "stovepiped" career approaches that civilian workforce members experience. Such broadening opportunities should be considered for expansion to lower-graded/-paybanded employees. Additionally, the AAC and other Service components must continue to concentrate on attracting, recruiting, and retaining our future acquisition workforce. Colleges and even high schools should be targeted to market acquisition as an important and rewarding career move. Likewise, midlevel recruitment needs to be refined so that new applicants with industry experience can be easily assimilated into the Army's acquisition workforce.

While I have benefited from various opportunities offered by the AAC, I recognize that the AAC is not about me personally—it is about how the entire acquisition, technology, and logistics community can best support the warfighter through the planning, acquisition, and lifetime support of critical systems, products, and services. The AAC accomplishes this mission by providing its workforce world-class education, training, and experiential opportunities.

ARMY AL&T WRITER'S GUIDELINES
http://dacm.rdaisa.army.mil/

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Purpose
To instruct members of the AL&T community about relevant processes, procedures, techniques, and management philosophy and to disseminate other information pertinent to the professional development of the Army Acquisition and Technology Workforce (A&TWF).

Subject Matter
Subjects may include, but are not restricted to, professional development of the Army's A&TWF, AL&T program accomplishments, technology developments, policy guidance, and acquisition excellence. Acronyms used in manuscripts, photos, illustrations, and captions must be kept to a minimum and must be defined on first reference. **Articles submitted to *Army AL&T* will not be accepted if they have been scheduled for publication in other magazines.**

Length of Articles
Articles should be approximately 8 double-spaced typed pages, using a 20-line page, and must not exceed 1,600 words. **Articles exceeding 1,600 words will not be accepted.** Do not submit articles in a layout format or articles containing footnotes, endnotes, or acknowledgement lists of individuals.

Photos and Illustrations
A maximum of 3 photos or illustrations, or a combination of both, may accompany each article **in a separate file** from the manuscript. Please ensure that artwork is accessible for editing and not embedded in the manuscript. Photos may be black and white or color. **Illustrations must be black and white and must not contain any shading, screens, or tints. All electronic files of photos must have a resolution of at least 300 dpi (JPEG or TIFF). If they do not meet this requirement, glossy prints of all photos must be submitted via U.S. mail, Fedex, etc.** Photos and illustrations will not be returned unless requested.

Biographical Sketch
Include a short biographical sketch of the author/s that includes educational background and current position.

Clearance
All articles must be cleared by the author's security/OPSEC office and public affairs office prior to submission. The cover letter accompanying the article must state that these clearances have been obtained and that the article has command approval for open publication.

Individuals submitting articles that report Army cost savings must be prepared to provide detailed documentation upon request that verifies the cost savings and their reinvestment. Organizations should be prepared to defend these monies if higher headquarters has a higher priority for them. All articles are cleared by the Acquisition Support Center.

Submission Dates

Issue	*Author's Deadline*
January-February	15 October
March-April	15 December
May-June	15 February
July-August	15 April
September-October	15 June
November-December	15 August

Submission Procedures
Article manuscripts (in MS Word) and illustrations/photos (300 dpi JPEG or TIFF) may be submitted via e-mail to **bleicheh@aaesa. belvoir.army.mil**, or via U.S. mail to the address in the first paragraph at the top of this page. All submissions must include the author's mailing address; office phone number (DSN and commercial); and a typed, self-adhesive return address label.