WAR MANAGEMENT

A solitary soldier runs across a desert at dawn, seemingly oblivious to the squad jogging past in the opposite direction or the helicopter flying overhead. "Even though there are 1,045,690 soldiers just like me, I am my own force," we hear him say. "With technology, with training, with support, who I am has become better than who I was."

This television commercial, the first salvo in a $150 million advertising campaign to recruit a new generation of soldiers to the U.S. Army, reflects how the Army thinks potential recruits see themselves today. "We are seeking smart, technologically savvy people," says Col. Kevin Kelley, director of advertising and public affairs for Army Recruiting Command at Fort Knox, Ky. These "Army of One" ads also reveal something of how the Army sees itself today. "The Army is in a transformation stage now, needing to become more agile and rapidly deployable," Kelley adds.

Knowledge management plays a central role in this transformation, which is taking place in all branches of the U.S. armed forces. Paradigm shifts have challenged the military in the decade since the Gulf War. While the private sector talks about the new economy, the defense establishment wrestles with the idea of a revolution in military affairs. As the services deploy everything from portals to handheld wireless devices, they are pursuing the same advantages through knowledge that the private sector seeks. "In the same way as business, the military is striving for competitive advantage," says William Millward, a former

By Steve Barth

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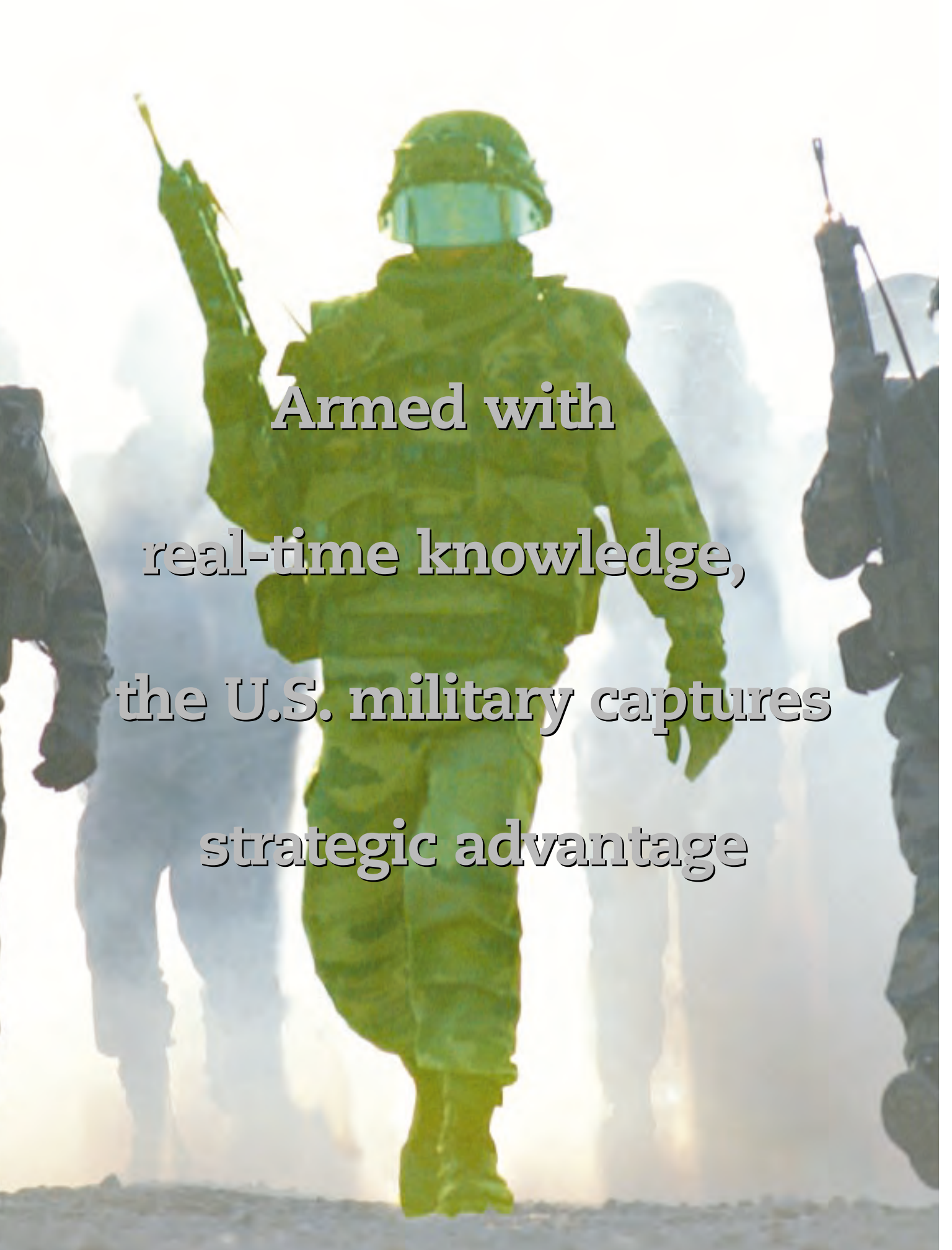
Armed with
real-time knowledge,
the U.S. military captures
strategic advantage

career Navy officer who is now CEO of Applied Knowledge Group Inc., a consultancy in Reston, Va.

It is also encountering many of the same challenges—with an extra edge. Executives like to quip that business is war. But when war is war, commanders feel a different kind of urgency. The lessons they learn about managing knowledge to stay ahead of the competition may be literally matters of life and death.

CONTINUOUS IMPROVEMENT

Innovation is essential to successful warfare. An often-repeated lesson of military history is the danger of relying on and replicating best battle practices. Warfare strategy must always push the envelope because one's enemy is probably learning, adapting and evolving also.

"If you want to be ahead in conflict and win in competition or in war, you have to go beyond," says Alex Bennet, deputy CIO for enterprise integration at the Department of the Navy (which includes both the Navy and Marine Corps) in Arlington, Va., and a prominent advocate of KM in the defense sector.

For example, because the United States has demonstrated overwhelming superiority in waging conventional war, the strategist must assume that no future enemy would want to challenge the country in that fashion, according to Col. Thomas X. Hammes, commander of the Marine Corps' Chemical/Biological Instant Response Force in Indian Head, Md. "An intelligent opponent will look for another way," he says.

Hammes points out that the weapons and tactics that defeated Iraqi forces head-on in the Gulf War were ineffective against the warlords of Somalia, who avoided direct confrontation. Moreover, potential foes have kept up with many recent developments. "All of the modern systems we developed for the Cold War now help insurgents find us," he adds. "They can go on the Internet and get information on ships sailing and plane departures. They can buy inexpensive, handheld thermal cameras that look for military-type targets or get satellite photos with one-meter resolution from commercial sources."

Hammes—who speaks from personal experience rather than as a representative of current military doctrine—says that U.S. military leaders are beginning to acknowledge that the enemy "doesn't look like he used to and doesn't look like us." That's a lesson likely to resonate with business leaders in any industry in which established front-runners have been challenged by agile upstarts using innovative business models.

THE KNOWLEDGE LOOP

How then can the military become agile and able to innovate as required? Enduring advantages come less from advanced technology than from applied learning, so the military's new efforts focus both tools and tactics on supporting innovation and rapid decision making. "All branches are involved in the rapid turnaround of information, adding context to make it knowledge, for both the decision maker and the soldier executing the decision," says Millward of Applied Knowledge Group.

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>
> Col. Thomas X. Hammes, commander, Marine Corps Chemical/Biological Instant Response Force

As a combat pilot in the Korean War, the late Air Force Col. John Boyd came to understand that maneuverability, rather than speed and power, was the unbeatable advantage in aerial combat. Trained in both economics and engineering, Boyd boiled down this observation to a mathematical formula that led the Air Force to change strategy and develop light, more maneuverable fighter jets rather than more powerful, feature-laden planes.

Later, he extended the same principle beyond one-on-one combat. As a civilian analyst in the Office of the Secretary of Defense, Boyd championed what he called the OODA loop—viewing combat as a cycle of observation, orientation, decision and action—as the basis of agile warfare. Orientation emphasizes the context in which events occur, facilitating decisions and actions; it performs the role often associated with knowledge in a business setting. An agile warrior in the heat of battle is both shaping and being shaped by a complex, unpredictable environment.

"In conflict, I want to penetrate and disrupt my adversary's orientation," says Franklin Spinney, a defense analyst at the Pentagon in Arlington, Va., who worked with

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Boyd for 23 years. "If he can't keep up with my tempo or perceive the pattern of my rhythms, he will see increasingly ambiguous images that are behind what is actually occurring. He will take actions to adapt to circumstances that are no longer relevant. As he falls further and further behind, the menace he must overcome grows more awesome in his mind, leading to doubt, confusion, fear and ultimately panic and chaos."

Orientation, in this sense, is knowledge management. Information, education and experience come together to provide competitive advantage whether the goal is domination of territory or markets.

NETWORKING WAR

The most tangible result of this new thinking is Network Centric Warfare (NCW), a program developed at the Joint Staff Directorate for C4 Systems (the four Cs are command, control, communications and computers) at the Pentagon in Arlington, Va. The basic idea is to turn information superiority into battle superiority by deploying a global wireless network that links commanders and soldiers to high-tech tools for observation, sensing and data collection. NCW should increase information flow up, down and across the hierarchy. More importantly, according to John Garstka, chief technology officer at the directorate, NCW accelerates the process of turning information into knowledge and awareness to gain advantage in battle.

If battlefield conditions are accurately represented as information, he says, troops and their commanders have access to a common operational picture. If everyone has enough education and experience to understand the implications of the information, they can achieve shared "situational awareness"—what Boyd would call orientation. When personnel combine situational awareness with an understanding of their commander's intent, everyone can work toward the common objective by making better decisions faster.

In practice, battle leaders can tap the flow of information from sensors and personnel to adapt tactics and strategies in real time, broadcasting their evolving objectives to troops. The troops can update their orders but also act autonomously as necessary.

"The ability to share information at the tactical level dramatically increases shared situational awareness," Garstka says. "It is not a fair fight if you have that advantage and an adversary doesn't."

In the old days of "platform-centric" warfare, soldiers, sailors and pilots had to rely largely on their own eyes and

THE LESSONS OF EXPERIENCE

The concept of action learning in the United States military goes back half a century to Gen. George Marshall, Army chief of staff during World War II, who wanted to introduce modern ideas of business management into the military. In the Army, the process has evolved as an effective form of emergent learning, says Marilyn Darling, founder and president of Signet Consulting Group West in San Diego, Calif. She has studied hundreds of after-action reviews (AARs) developed at the Center for Army Lessons Learned (CALL) but practiced throughout the service during training and operations.

"CALL is built to help a soldier on the battlefield succeed in his first contact with the enemy in a situation he has never experienced before," Darling explains. "Out there collecting lessons from actual battles, the CALL team is trying to build a body of knowledge that can be applied to the next time a unit finds itself in that situation." (For more on AARs, see "Learning By Doing" [March 2000 *KMM*] and "Bikers Learn From the Army" [February 2001 *KMM*].)

Michael Pearson, chairman of the Department of Command, Leadership and Management at the U.S. Army War College in Carlisle Barracks, Pa., adds that learning has become part of Army culture. "Over the last 20 years we have developed a corps of officers who value the learning that takes place in after-action reviews," he says. "By the time those officers get to the war college, at the 18- or 19-year mark of their careers, they want the feedback and don't feel complete without it."

Darling says there are many lessons for business in how the Army practices the process of learning. One in particular is the Army's approach to AARs. "They don't think of them as postmortems as much as planning activities to focus on doing better next time," she says. "What's important for knowledge management is that they don't believe a lesson is learned until it can be validated. And they don't consider it validated unless somebody actually tries to do something with it."—*S.B.*

the sensors installed on their particular platform (such as a tank, ship or aircraft) to target and engage the enemy. In the new model, each platform can learn from the others. "When you can network the force, it can change the way you fight," Garstka says. "It is similar to what is happening in the commercial sector with the Internet."

By increasing the timeliness and reach of battlefield information—the positions of all friendly and enemy forces, for example—through wireless voice and data channels, networked forces increase individual and collective effectiveness exponentially. A tank commander or naval gunnery officer doesn't need to "see" a target to hit it if someone else on the network can communicate where it is.

All this may sound theoretical, but, Garstka insists, "The combination of all those factors has been demonstrated in operational vignette after operational vignette." To illustrate, he cites these results from exercises and war games.

- Air Force analysis of 12,000 sorties credited the Joint Tactical Information Distribution System—which supplements F-15C pilots' own senses and onboard sensors with direct data from external sources such as airborne surveillance—with boosting the "kill ratio" of hits on the enemy by more than 2.5 times.
- In a battle experiment, Army infantry and helicopter units coordinated with the Navy and Marine Corps and responded to a simulated amphibious assault in only half the time of previous platform-centric tests.
- Army units equipped with a "tactical Internet" were able to operate at six times the normal operational tempo, with increased effectiveness in the lethality of their attacks and the survival rates of their personnel.

Such efforts, Garstka adds, have a ripple effect. "The bottom line is that success at the tactical level has operational implications, which have strategic implications."

MAKING IT WORK

Of course, sage military strategists have always understood that the only weapon that wins wars is the human being. Technology can accelerate human capabilities, but it cannot automate them. "Machines don't fight wars—people do, and they use their minds," says Spinney of the Pentagon. "We need to understand how people cycle through their OODA loops in war so we can make technology that can assist in overcoming our adversary without overloading our minds."

A Marine Corps effort called Project Albert is assessing the dynamics of new combinations of tactics and technology. "The reality is that each one of us—the marine

When you can network the force, it can change the way you fight.

John Garstka, chief technology officer, Joint Staff Directorate for C4 Systems

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on the ground, the pilot in the airplane, the commander in the tactical operations center—is making independent decisions based on local information interacting with other agents and with the environment directly," explains Mary Leonardi, a major in the Marine Corps Reserve and senior scientist at San Diego–based Science Applications International Corp., who is working on Project Albert as a contractor. "The Marine Corps is seeking to use technology not only to improve the way they fight but also to discover new and out-of-the-box tactics, doctrine and operational planning."

The goal of the project is to equip each of those agents to do their job, in a way analogous to empowering individual business units, teams or knowledge workers. "They are trying to put information in the hands of the lowest-level leader," Leonardi says. "The lower down you can push decision making the better, because those are the people that actually see the situation evolving in their face, not the colonel in a command center several miles away."

Hammes of the Marines emphasizes the network's potential to distribute decision making more effectively rather than to concentrate it. "You don't consolidate the fog and friction of war by bringing all of the decisions to one place," he insists. "If you do, you consolidate all of the uncertainty and increase the time it takes to make a decision."

THE POWER OF ONE

In this view, the key to effective command is not control but communication. Hammes and others emphasize that conveying "commander's intent" lets forces act autonomously to accomplish shared goals. Behind that, however, must be a culture of understanding, loyalty and trust. "If you understand your subordinates and they understand you, there can be almost instantaneous sharing of information," Hammes says.

"Marine Corps' maneuver warfare stresses that you do everything you can to reduce uncertainty, but you can't eliminate it," he continues. "You understand the environment you are operating in. You make sure that your side knows what it is you are trying to accomplish and how you see it. Then they are free to make decisions. If they see an opportunity to exploit, they can go for it."

"To become a knowledge-centric organization, you must be a learning organization. But it's not enough to learn; you have to do something with the learning," says Bennet of the Navy Department. "We're connecting information and people, not just connecting hardware and software. The connectivity in turn enables the network-centricity, which enables knowledge superiority." K

Steve Barth is KMM*'s editor-at-large.*