FOG, FRICTION, and TECHNOLOGY

Improving the acquisition process for emerging networked command and control/situational awareness technologies

by MAJ Shane Robb

SITUATIONAL AWARENESS

A Soldier uses Force XXI Battle Command Brigade and Below (FBCB2) to track friendly forces, exchange messages, and navigate the battlefield, empowering subordinate leaders on the ground to take the initiative and accomplish the commander's intent. The Army is making progress in mitigating the "fog and friction" of the acquisition process to deliver these and other cutting-edge capabilities. (U.S. Army photo.)

HISTORY IS FULL OF EXAMPLES OF HOW THE CAREFUL FUSION OF EMERGING TECHNOLOGIES WITH IMPROVED DOCTRINE HAS MITIGATED THE FOG AND FRICTION OF WAR AND PROVIDED A MILITARY ADVANTAGE.

The motion picture "Black Hawk Down" depicts a real-life scenario from October 1993 in Mogadishu, Somalia. Despite nearly perfect situational awareness at the U.S. command post, when a Black Hawk helicopter was shot down, the fog and friction of a high-intensity conflict began to take hold. The leaders in the command post could see in real time the locations of the downed aircraft, the converging armed mobs, and the friendly forces. But as they attempted to direct Soldiers to the downed helicopter, they could not relay the exact timing of the upcoming turn, causing the convoy to miss the turn and continue down the wrong road under heavy hostile fire.

Seeing no other option, the Soldiers in the convoy were forced to turn around and drive back through the heavy fire. With barricades being built, the enemy converging, and casualties mounting, the convoy returned to base. Other Soldiers on the ground struggled to get to the downed aircraft. They arrived, but not quickly enough and without sufficient force to effectively evacuate the aircrews before becoming isolated and taking heavy casualties.

Nearly 20 years after the conflict portrayed in "Black Hawk Down," it is easy to see how far we have come in developing networked, platform-level, digital, command and control/situational awareness (C2/SA) capabilities. If the vehicles in that conflict had been equipped with Force XXI Battle Command Brigade and Below/Blue Force Tracking (FBCB2/BFT), they would have seen their location on a satellite image background, as well as the locations of all other friendly forces, including the downed helicopter. As surveillance aircraft located enemy forces and barricades, icons and graphics could have been created to display their exact locations on all of the FBCB2 systems in the vehicles. With this information, the convoy commander could have used his own enhanced understanding of the situation to take the initiative and direct the convoy directly to the downed aircraft and back to base.

As it was, despite the SA at the higher echelons, the Soldiers on the ground were not empowered to take the initiative, resulting in confusion and casualties.

FOG AND FRICTION IN ACQUISITION

The fog and friction of war as described by Carl von Clausewitz, the Prussian soldier and German military theorist (1780-1831), is inherent to battle. Fog and friction also wreak havoc on those fighting to provide enhanced capabilities to the warfighter. U.S. forces can look for ways to mitigate their effects.

A recent report of the Defense Science Board Task Force on DOD Policies and Procedures for the Acquisition of Information Technology explains that "the deliberate process through which weapon systems and information technology [IT] are acquired does not match the speed at which new IT capabilities are being introduced in today's information age." In short, the Army is not fielding advanced IT capabilities as quickly as they become available to industry. This should worry those in the acquisition community, because the country or organization that can field advanced IT capabilities fastest could gain a significant military advantage.

From the Prussians leveraging early railroads in the Austro-Prussian War to the Germans equipping tanks with radios during World War II, history is full of examples of how the careful fusion of emerging technologies with improved doctrine has mitigated the fog and friction of war and provided a military advantage.

Recent lessons learned from the use of networked, platform-level digital C2/SA systems in training and combat have also demonstrated that their incorporation into U.S. forces and doctrine will provide a tremendous advantage. Both FBCB2 and the prototype Nett Warrior battle command system have been used in combat and have been widely praised for the capabilities they provide to Soldiers.

MAPPING LOCATIONS

FBCB2 enables Soldiers to see their location on a satellite image background, as well as the locations of all other friendly forces. (U.S. Army photo.)

Examples include more accurate and timely directing of indirect mortar fire; no need to orient oneself immediately after an air assault landing; the coordination of direct fires to avoid fratricide; and coordination through a digital common operational picture that reduces the need for verbal radio communications.

The net results were the ability to act much faster than the enemy and a greatly reduced risk of fratricide.

By fielding networked, platform-level, digital, C2/SA capabilities to U.S. forces, we will enhance SA and, hence, situational understanding at all echelons of command. In particular, subordinate leaders on the ground will be empowered as never before to take the initiative and accomplish the commander's intent. In the acquisition community, we have an obligation to mitigate the fog and friction of the acquisition process in order to deliver these capabilities and maintain a military advantage over our adversaries.

OVERCOMING THE OBSTACLES

The struggle between the deliberate Army acquisition process and the urgent imperative to field emerging IT capabilities has been well-documented. The arguments are familiar: Security certification requires a painstakingly long wait; testing can be overly rigid, redundant, or poorly timed in the development cycle; contracts are not always designed to evolve with technological progress; and too often the choices are between an unproven up-and-comer and a costly tried-and-true vendor.

However, recently there has been significant progress in each of these areas as the Army made the network its top modernization priority. The National Security Agency (NSA), which previously took 18 to 24 months to certify a device to handle secret-classified data, has created commercial solutions for classified leveraging common standards—such as Federal Information Processing and National Information Assurance Partnership—to securely protect the data on emerging devices while slicing almost a year off the certification time.

On the Army side, Project Director Communications Security (PD COMSEC) within Program Executive Office Command, Control, and Communications-Tactical (PEO C3T) has become a much-needed hub for system developers and integrators seeking encryption expertise. For example, many system engineers deem Type 1 encryption necessary on capabilities that

AS THE SINGLE INTERFACE BETWEEN THE ARMY AND NSA TO FIND THE BEST KEY MANAGEMENT AND CRYPTOGRAPHIC MATERIEL SOLUTIONS, PD COMSEC IS STREAMLINING THE SECURITY CERTIFICATION PROCESS WITHOUT JEOPARDIZING INFORMATION SECURITY.

require less than the top-secret protection it can provide. PD COMSEC can prevent a waste of time and resources by guiding these individuals to alternatives to Type 1 when lesser security levels are appropriate. As the single interface between the Army and NSA to find the best key management and cryptographic materiel solutions, PD COMSEC is streamlining the security certification process without jeopardizing information security.

The testing community is also finding ways to better keep pace with industry without compromising the Army's robust standards. The series of four Network Integration Evaluation (NIE) and Network Integration Rehearsal events, which began in June at Fort Bliss, TX, and White Sands Missile Range, NM, and will run through 2012, yield operational efficiencies by sharing costs and utilizing the same available brigade. Efficiencies will also be seen on the battlefield, where Soldiers across separate echelons will plan and execute the battle in a synchronized fashion using a Network Capability Set.

The new testing and equipping model allows the Army to evaluate programs of record and new ideas from industry more quickly, integrate them before fielding to units in combat, and make incremental improvements based upon feedback.

From an FBCB2 perspective, Soldier feedback from the limited user test for FBCB2 Joint Capabilities Release at the NIE will influence the design and capabilities of Joint Battle Command-Platform (JBC-P), the next-generation FBCB2/BFT technology for tactical aircraft, vehicles, and dismounted forces that will be fielded to the Army and the Marine Corps beginning in FY13.

MODULAR STRATEGY ACCELERATES DELIVERY

A more modular acquisition strategy can also accelerate delivery of these capabilities to the warfighter.

For example, in the past, FBCB2 used one main contractor that handled software development and subcontracted out for other requirements such as hardware. Trying to steer that one large contract became ponderous and inefficient, so PEO C3T's Project Manager (PM) FBCB2 changed the approach. The lead for software development was handed over to the Software Engineering Directorate within the U.S. Army Aviation and Missile Research, Development, and Engineering Center, and a number of smaller contracts were awarded for the various parts of FBCB2.

This strategy allows for a higher degree of control and flexibility for the PM office. Funding can be handled more effectively as well. Most important, having the government set the standards and software framework ensures that regardless of who develops them, applications will be secure and interoperable with existing mission command systems so that information flows seamlessly across all echelons of the force. This approach for the JBC-P family of systems is aligned with the Assistant Secretary of the Army for Acquisition, Logistics, and Technology Common Operating Environment (COE) strategy. A modular acquisition strategy, coupled with a COE, facilitates more frequent contract competitions for hardware or other functionality by reducing reliance on the domain expertise of vendors. This is critical in enabling the Army to keep up with industry.

Just as the Army's brightest engineers have innovated networked, platform-level, digital C2/SA technologies to cut through the fog and friction of war as experienced in Mogadishu, it is our responsibility to get these capabilities into Soldiers' hands. With the network now central to our modernization goals, we are on the right path.

MAJ SHANE ROBB is the Assistant Product Manager for JBC-P. He holds a B.A. in political science from Brigham Young University and an M.B.A. from Webster University.