

The Division Advanced Warfighting Experiment (DAWE) started like most Battle Command Training Program (BCTP) Warfighter exercises. The artillery of the opposing force (OPFOR), the “Red God of War,” not only vastly outnumbered the friendly artillery, it out-ranged, out-supplied and, with centralized command and control procedures, outmaneuvered the friendly artillery. However, by the end of the exercise, the OPFOR’s center of gravity—his artillery—lay smoldering in ruins.

The November 1997 DAWE at Fort Hood, Texas, involved the 4th Infantry Division (Mechanized) as well as some III Armored Corps, Army Reserve and National Guard units serving as the Experimental Force (EXFOR). There were several train-up exercises with the actual DAWE consisting of four consecutive battles lasting nine days. The EXFOR’s Force XXI fought these battles in large areas of operations (AOs) with frontages of up to three times larger than current doctrinal division fronts.

Critical to the EXFOR’s victory was the success of the counterfire battle that eliminated the OPFOR artillery as a major player. This article examines the DAWE counterfire fight, the adjustments each side made as the various

battles progressed and doctrinal possibilities for future counterfire.

OPFOR Artillery

The DAWE counterfire battle was a challenge because the threat forces had more artillery systems, many of which fired longer ranges at higher rates of fire. (See Figure 1.) In addition, the OPFOR protected its artillery with robust air defense coverage.

Just as the DAWE units modernized for the exercise, so did the OPFOR. Its longest range multiple rocket launchers (MRLs) were the 280-mm WM-80s, which fired out to 80 kilometers, and its 300-mm 9A52 that could reach out to 70 kilometers. The OPFOR also had the 220-mm BM-22 that ranged to 40 kilometers. The enemy’s gun-howitzers included the 152-mm 2S19 with a rocket-assisted projectile (RAP) range of 40 kilometers and the 203-mm 2S7 that could range out to 50 kilometers with RAP.

The 9A52 and BM-22 units had a fire mission processing system that provided capabilities similar to those of the advanced Field Artillery tactical data system (AFATDS). Placed at the battery level, this system allowed the OPFOR to mass the effects of fires without positioning his assets together.

The OPFOR artillery fielded an impressive array of countermortar and counterfire radars. In addition to sound and flash units, the OPFOR employed ARK-1, SNAR-10 and the Type 704 counterfire radars. The OPFOR also employed many aircraft and unmanned aerial vehicles (UAVs) and drones with photo, communications intelligence (COMINT) and electronic intelligence (ELINT) capabilities to find the DAWE artillery. As in similar exercises, many special operations reconnaissance teams infiltrated

EXFOR - 116 Tubes and MLRS

Iran - 1,000 Tubes and MRLs

Germany - 1,350 Tubes and MRLs

Israel - 1,400 Tubes and MRLs

OPFOR - 3,170 Tubes and MRLs

North Korea - 5,500 Tubes and MRLs

Figure 1: The OPFOR artillery in the DAWE consisted of 2,616 artillery tubes and 554 multiple rocket launchers (MRLs)—a lot of artillery as shown in the comparison to the artillery of other nations. The EXFOR artillery was considerably smaller with 90 Crusader howitzer tubes and 126 multiple-launch rocket systems (MLRS). (The OPFOR and EXFOR artillery numbers represent the total systems in the four battles over a nine-day period.)

The Counterfire Battle in the DAWE

by Colonel Bruce A. Brant



behind the forward line of own troops (FLOT) seeking friendly radars and artillery to destroy.

DAWE Artillery

For the counterfire battle, the EXFOR division artillery (Div Arty) commander had significant assets. His three direct support (DS) battalions were Crusader-equipped (3x6) and each had a Q-36 radar. Their primary counterfire mission was against mortars and regimental artillery groups (RAGS). The Div Arty also commanded and controlled the divisional multiple-launch rocket system (MLRS) 2x9 battalion that includes a target acquisition battery (TAB) and a headquarters, headquarters and services battery. (In previous articles, this unit has been referred to as the command and attack battalion, or CAB.)

Supporting the division was the 214th FA Brigade, III Armored Corps Artillery, from Fort Sill, Oklahoma, and the 138th FA Brigade from the Kentucky Army National Guard in Lexington. The Div Arty commander attached his target production section (TPS) and Q-37 radars from the divisional MLRS battalion to the 214th FA Brigade, which he designated the counterfire headquarters. The 214th FA Brigade controlled

two other Q-37 TA detachments, one of which was a decoy detachment. Each brigade was assigned two MLRS battalions and a Crusader battalion.

These units gave the EXFOR artillery a total tube strength of 90 Crusaders and 126 MLRS launchers.

During the DAWE, the 214th FA Brigade used three automated systems to enhance fire mission processing and situational awareness. The advanced FA tactical data system (AFATDS) planned and executed targets, targets lists and fire support coordinating measures (FSCM) and provided unit status reports and radar information. The maneuver control system/Phoenix (MCS/P) gave the friendly and enemy unit situational awareness and graphics plus relayed operations plans (OPLANs), operations orders (OPORDs) and situation reports (SITREPs). The all-source analysis system (ASAS) provided essential enemy information from multiple sources as well as analysis and intelligence reports.

One device that facilitated command and control was a video teleconference (VTC) whiteboard that allowed commanders to talk face-to-face with and collaboratively draw graphics on a digitized map. Using this device, the division commander could discuss new intelligence, wargame courses of action and formulate orders directly with his commanders in the Div Arty, brigade combat team (BCT), and aviation brigade tactical operations centers (TOCs) or his staff in the division command posts (CPs). The entire planning process often took minutes instead of hours.

During whiteboard commanders' sessions, the 214th FA Brigade commander displaced to the forward division CP (DTAC) where the Div Arty commander fought the battle. At the DTAC, he coordinated any changes to the commander's intent, missions, priorities and organization with the Div Arty commander. He then synchronized the changes with the 138th FA Brigade.

The DAWE offered the opportunity to work with future weapons, acquisition systems and munitions. Crusader fires 155-mm projectiles almost 50 kilometers at a rate of up to 12 rounds a minute. It can displace 750 meters in only 90 seconds, greatly improving survivability. A single howitzer can fire up to eight rounds out to 20 kilometers on a time-on-target mission. The system includes self-laying, computing and locating technology.

The improved MLRS M270AI launcher was the standard. In addition to its new array of rocket and missile munitions, the launcher's improved ability to stow, displace, elevate and slew has reduced its exposure by 75 percent.

Firefinder Q-36 Version 8 can acquire 20 targets a minute with increased range and accuracy. The Block II Firefinder Q-37 increases range and accuracy to 60 kilometers in the mode for conventional artillery or acquires up to 250-plus kilometers in the mode for theater ballistic missiles.

Clearly, one DAWE success was the enhanced munitions. Crusader fired the extended-range dual-purpose improved conventional munition (DPICM) with 85 bomblets to 47 kilometers and sense and destroy armor (SADARM) with two submunitions to 27 kilometers. The millimeter wave and infrared sensors of the submunitions have a 130-meter radius search footprint.

MLRS fired the extended-range rocket (ER-MLRS) to 45 kilometers and the guided MLRS (GMLRS) out to 60 kilometers. The star of the rocket munitions was the MLRS smart tactical rocket (MSTAR). It carries fire-and-forget munitions to a range of 60 kilometers. MSTAR submunitions have a four-kilometer search area and are deadly against enemy armor.

The Army tactical missile system (ATACMS) also had new munitions. The Block IA carries an anti-personnel anti-materiel (APAM) missile to 300 kilometers. The Block II carries 13 fire-and-forget antiarmor submunitions, called BATs, to 140 kilometers while the Block IIA took six improved BATs 300 kilometers.

These munitions proved devastating against not only doctrinally templated artillery units that had been confirmed and counterfire units, but also moving artillery formations.

Counterfire Fight

The Div Arty commander's intent for the counterfire battle was to leverage all intelligence sources "to proactively attack and kill the enemy's fire support systems to deny him the capability to influence the battle while providing reactive counterfire with a near instantaneous sensor-to-shooter trigger that is agile and paralyzes enemy fires to protect friendly forces." The counterfire battle was divided into proactive and reactive.



The EXFOR Div Arty controlled proactive counterfire while the 214th FA Brigade controlled the reactive counterfire fight. Initially, the goal was for 75 percent of the counterfire effort to be proactive. While this goal was not met, more than 50 percent of enemy artillery was destroyed by proactive means. The ability to prosecute proactive counterfires was a quantum leap forward as compared to past BCTP Warfighter exercises.

The Div Arty commander was surrounded by real-time intelligence systems at the DTAC. Sitting next to the Assistant Division Commander (Maneuver), he quickly determined the latest division priorities and focus, confirmed intelligence collection and then targeted the enemy's artillery. He then sent fire missions via the DTAC fire support element (FSE) AFATDS through the Div Arty TOC to the FA brigades to fire.

The FA brigades could not receive intelligence reporting on their all-source analysis system (ASAS) fast enough to meet targeting criteria. However, the DTAC monitored joint surveillance and target attack radar system (JSTARS) and UAV real-time feeds, showing the enemy's actual movement on the battlefield. This real-time intelligence and situational awareness allowed the Div Arty commander to immediately employ his reinforcing brigades against high-priority targets within their range limits.

Normally, the UAVs were attached to the maneuver brigades instead of being controlled by the division fire support coordinator (FSCOORD). Although the Div Arty and FA brigades had no ground control station to fly the UAVs directly, the DTAC FSE did have this capability. At times, fire supporters had direct control of the divisional UAV through the DTAC FSE. Usually when JSTARS observed artillery movement while focusing on a named area of interest (NAI), a UAV was sent to confirm the target. The enemy units were then monitored moving into a target area of interest (TAI) and attacked.

Critical to the reactive counterfire battle was the use of FSCM and radar zones. The coordinated fire line (CFL) had to be kept as close to the FLOT as possible to facilitate rapid clearance of fires. This proved incredibly difficult in the DAWE with the increased agility of the attack aviation and division cavalry squadron.

Huge covering force operations areas created large gaps in Q-36 coverage.

While Q-37 radars could fill the gaps, a common sensor boundary was difficult to maintain. Radar acquisitions short of the CFL were sent to the Div Arty to coordinate with the brigade and task force fire support officers (FSOs) for clearance. This often took 30 minutes—much too long to fire on a fleeting OPFOR artillery target.

Even with AFATDS and MCS/P, the Div Arty had to continuously update situation reports from the FSOs because the battle moved faster than the digital process. TPS and the Div Arty and brigade S2s continuously worked intelligence preparation of the battlefield (IPB) to template enemy formations. They overlaid the locations with call-for-fire zones (CFFZ) to confirm templates and attack rapidly. CFFZs short of or near the CFL were sometimes “pre-cleared” of maneuver units to facilitate the speed of the attack.

Each acquisition was plotted on a map by color relating to a time of fire. This greatly aided targeting, reading enemy order of battle and calculating battle damage assessment (BDA).

Often, large enemy artillery formations were plotted and sent to the Div Arty and corps for nightly aviation deep attacks. (As it turned out, the traditional aviation deep attack was never executed during the DAWE because the enemy formations were so damaged by artillery by H-hour that they no longer constituted targets suitable for aviation attack.)

Critical friendly zones (CFZ) shortened the response times and protected high-value targets and critical terrain. The rapid mobility of the division demanded continual maintenance of CFZ plans.

Counterfire Battle Drill. The counterfire battle drill used by the 214th FA Brigade took advantage of digital systems, accommodated the work-arounds between AFATDS and the initial fire support automated system (IFSAS) and ensured a “man in the loop” to visually check data and target plots before missions were fired. (See Figure 2.)

An important part of the DAWE for artillerymen was linking the FA brigades equipped with IFSAS and the Div Arty equipped with AFATDS. In the future, different versions of systems must work together, so the DAWE provided an excellent opportunity to try linking two generations of technology. The FA brigades, Div Arty and Field Artillery School at Fort Sill worked together to develop tactics, techniques and proce-

dures (TTP) and work-arounds to accommodate both systems. These fell into three main categories: mission processing, sensor-to-shooter interface and message interoperability.

Mission Processing. AFATDS' ability to process missions quickly would overwhelm IFSAS. In addition, changes made by IFSAS to an AFATDS-generated fire order only could be communicated back to the AFATDS via the mission-fired report (MFR)—after the mission was executed. To accommodate the differences in the systems, soldiers had to interface at MLRS command posts for work-arounds, increasing firing times.

Sensor-to-Shooter Interface. The interface between Firefinder and AFATDS caused several problems. AFATDS does not prioritize radar acquisitions in terms of radar zones. IFSAS was used to process these missions. When AFATDS received a radar acquisition, it determined if it violated a CFZ, CFFZ or artillery targeting intelligence (ATI). When acquisitions were received at the 214th Brigade IFSAS, the determination was made to attack the target. If the target was short of the CFL, the fire mission was passed to the Div Arty via AFATDS where the Div Arty used AFATDS digital coordination requests to clear the target. Once cleared, the Div Arty counterfire officer then sent the target back to the brigade IFSAS to process. Targets beyond the CFL were simply attacked via IFSAS.

Message Interoperability. Perhaps the greatest IFSAS-AFATDS challenge was in message interoperability. Some of these problems were—

- The AFATDS' mission message had to be displayed in IFSAS to ensure the format was correct before the mission was entered into IFSAS. Because IFSAS only accepts geometry names of up to seven characters, AFATDS geometry names often caused the IFSAS operator to have to correct the message for IFSAS and manually input it. The AFATDS database also allows far more target types than IFSAS recognizes. The IFSAS operator had to re-input the message using IFSAS terms, which were not as descriptive as AFATDS and did not always precisely meet Div Arty targeting criteria.

- Although AFATDS could pass fire plans, the IFSAS operator had to build a separate fire plan file so IFSAS could accept the AFATDS fire plan.

- If the AFATDS operator altered the database during a battle, the IFSAS fire

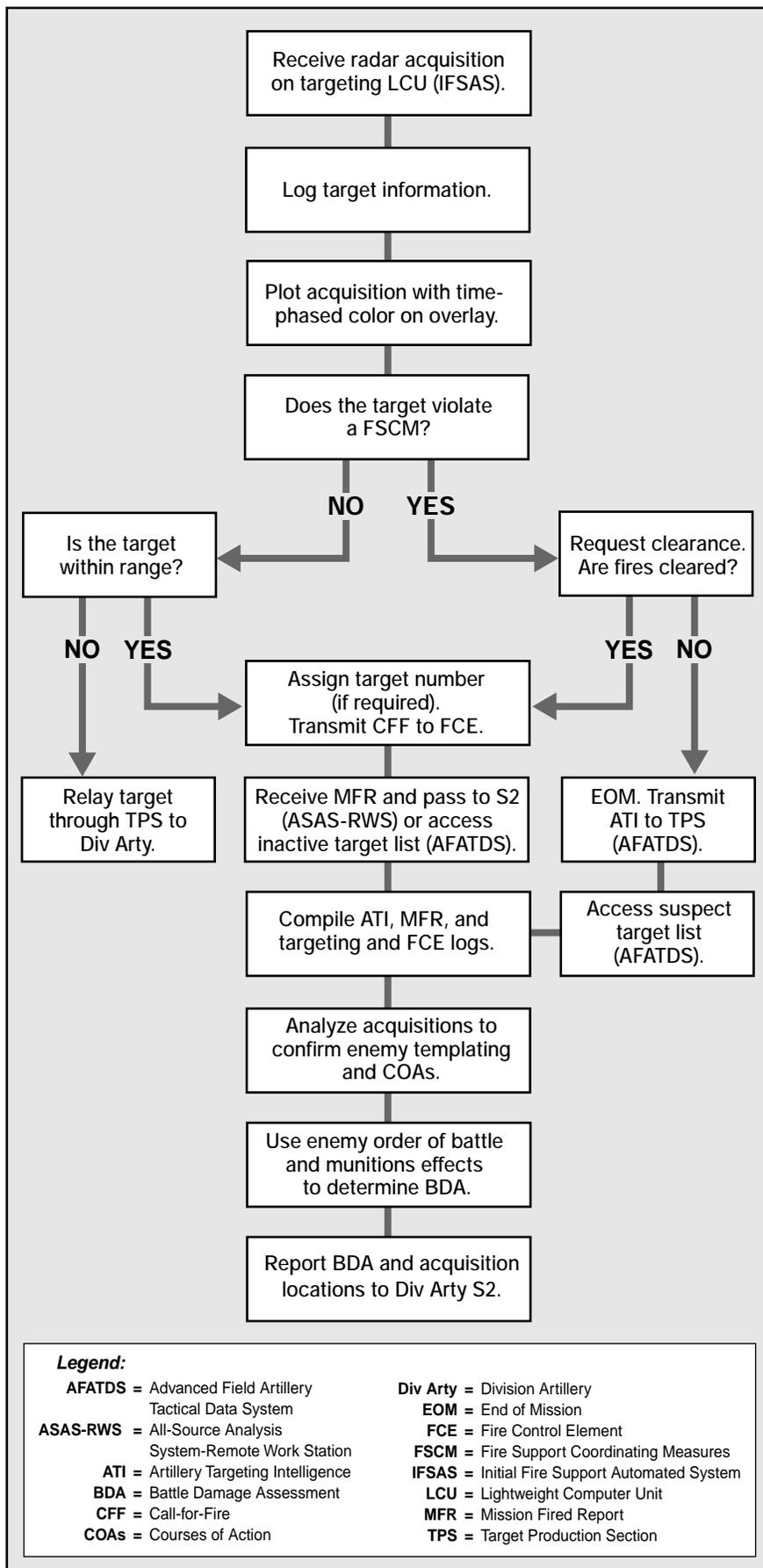


Figure 2: Counterfire Battle Drill

control element (FCE) had to revert to accepting missions by voice until the database was corrected. If the databases were the same, IFSAS fire missions were processed automatically.

Work-arounds performed at the operator level reduced the impact of unrecognizable geometry, target types and fire plans, but they also reduced responsiveness.

The week after the DAWE, the AFATDS Project Manager, Training and Doctrine Command (TRADOC) System Manager for AFATDS (TSM-AFATDS) and representatives of developers, contractors, the 4th Infantry Div Arty, 214th FA Brigade and the FA Center's Project 2000 met. Their purpose was to take advantage of what was learned about AFATDS during the DAWE and develop a course of action to adjust for easier AFATDS-IFSAS interoperability and correct the deficiencies found in AFATDS.

Half-Time Changes. During a train-up exercise for the DAWE, the OPFOR was unsuccessful in meeting his objectives, so he modified his TTP and doctrine significantly. For the final exercise, the OPFOR employed new TTP against the EXFOR. The changes included the following:

- Doubling the number of special forces reconnaissance teams operating deep in the division rear area.
- Shifting his reconnaissance team priority from aviation to MLRS units and his UAV priority to MLRS units.
- Moving his target acquisition radars forward with his division reconnaissance assets and changing his fires priority to MLRS and radar units.
- Creating TTP to counter Crusader and MLRS by first firing family of scatterable mine (FASCAM) minefields to hold them in place while he fired a rolling barrage.
- Committing army and army artillery groups (AAGs) farther forward behind the most forward detachments.
- Orienting first-echelon forces on the EXFOR's fires complex instead of the maneuver brigades.
- Adding regimental indirect fires to barrages designed to suppress and destroy forward MLRS launchers.
- Varying his speed of movement to throw off the timing of the attack between an NAI and TAI.

It was obvious from these changes that the counterfire battle during the train-up exercises had forced the OPFOR into major adjustments. Clearly, his priority

was to defeat the EXFOR counterfire capability.

Keys to Success. Although some of the OPFOR's new TTP worked initially, the EXFOR division quickly adjusted.

The EXFOR developed several TTP that set the conditions for success in counterfire. All the TTP listed also apply during routine BCTP exercises.

- The Assistant Division Commander (Support) ran rear operations just as if he were on the FLOT. He used every available asset to find, fix and destroy the "eyes" of the OPFOR before they attacked or called for air strikes on critical command and control nodes, aviation assets, main supply routes and support units. This kept the OPFOR from attacking counterfire assets and ensured timely ammunition resupply.

- Extensive force protection was attached to the Q-37 radars. The radar provided maneuver forces, air defense, engineers and smoke capability. Several OPFOR UAVs were shot down while trying to confirm locations and came too close to the radars. (Although this TTP was employed by the EXFOR from the beginning of the DAWE, it really began to show its value as the OPFOR focused on killing the EXFOR artillery.)

- MLRS and Crusaders stayed behind hills, whenever possible, to minimize sighting and attack time by enemy aviation assets. Crew drills included immediate smoke and movement when the air defense early warning system announced inbound attack helicopters.

- Although maneuver assets were often used to protect MLRS, the best technique was to stay right behind lead maneuver task forces as they cleared enemy forces in front of them. This gave the launchers added range and ensured "stay-behind" forces did not attack them from the rear.

- Although FA brigade liaison officers (LNOs) normally are sent to the Div Arty or unit headquarters they are reinforcing, LNOs were sent from the Div Arty to the FA counterfire brigade headquarters during the DAWE. The FA brigades sent LNOs to the maneuver brigade TOCs. This greatly helped coordination with the maneuver units for force protection, unit locations, movement of the CFL and Q-36 radar coverage.

- The FA brigades closely monitored the movement and placement of their forward logistics elements (FLEs). They anticipated logistical needs and coordinated with maneuver forces for pro-

tection of the FLEs and, at times, collocating or exchanging FLE stockages.

Lessons Learned

There were, of course, thousands of doctrinal, tactical and technical lessons from the DAWE. These are but a few from the counterfire headquarters perspective.

- During the days of the "active defense" doctrine, there was a saying about killing tanks: "If I can see you, I can hit you—If I can hit you, I can kill you." During the DAWE, the same could be said about enemy artillery as well as armor. The combination of the eyes of JSTARS, Comanches, UAVs and Q-37 radars left no place for enemy formations to hide. The EXFOR identified, categorized, prioritized, attacked and destroyed the enemy's formations before his combat power was brought to bear on the battlefield.

- Enemy doctrinal artillery templates, such as DAGs and RAGs were rapidly confirmed and attacked. This forced the OPFOR away from his doctrine and OPLANS. His artillery groups had to disperse among his maneuver forces, decreasing command and control and his ability to rapidly mass fires.

- Smart munitions not only killed the enemy, they also provided greater friendly force survivability because of their reduced signature as well as their drastically reduced logistics requirements.

- At the same time, smart munitions raise the probability of fratricide—they can't distinguish friend from foe in a target area. Firing smart munitions call for complete discipline to clearance procedures and minimum safe distances and for fire supporters to understand the munitions' capabilities and limitations in detail.

- The increased size of the division AO demands two reinforcing artillery brigades for full coverage and rapid response.

- Automation decreases the fog of war, but it also increases the friction of war.

- There is no end date for automation experimentation. Artillerymen have used digital automation for many years. We grew up with the Field Artillery digital analog computer (FADAC), tactical fire direction system (TACFIRE), TI-59, backup computer system (BUCS), light TACFIRE, the battery computer system (BCS), IFSAS and now AFATDS. Every piece of hardware has several versions of software. Artillerymen working outside their own brigade or Div

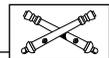
Arty have had to develop work-around procedures for different hardware-software configurations.

That is the future. All US forces—active and reserve components—will never have the same version of software and hardware—much less our coalition forces. A critical skill for soldiers in the future is the ability to assimilate various automation systems to meet commander's needs and ensure interoperability.

DAWE was successful at almost every level. Future automation, intelligence, information and weapons systems used make it is easy to credit technology with the victory—to minimize the effort of soldiers and leaders. Just the opposite is true.

The DAWE environment stretched soldiers' capabilities to think and solve problems for themselves. They often had to decide what information was important and what wasn't, when to act on their own and when to request help. They combined their independence with their abilities to manipulate databases to fit commanders' needs.

The EXFOR won because it acted inside the OPFOR's decision cycle and created opportunities that it quickly exploited. The division commander and his subordinate commanders changed plans "on the fly" (often using the video teleconference whiteboard) to mass when necessary or take advantage of an enemy vulnerability. Automation provides insight, but the leaders provided the determination, the creativity, the agility to win. Training must continue to develop leaders and warriors—not digital soldiers.



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