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nique that has been used effectively at night is to have an injured soldier, once he knows he has been hit, break out a chemical light and mark his position. In daylight, a visual signaling panel (VS-5 or VS-17) can be used to mark casualties, which will help the casualty collection teams as they sweep the objective.

The use of a CCP in day and night training has to be exercised. Platoon and company medical personnel have to practice their trade as often as possible. These are the soldiers who will save the most lives at a CTC. A senior company medic needs to ensure that each platoon medic and combat lifesaver understands the company SOP for marking casualties for evacuation.

Standardized marking and separation procedures will assist in a rapid evacuation of the time-urgent casualties. An easy way to separate casualties is the "ID-ME" system: I for *Immediate*, D for *Delay*, M for *Minimal*, and E for *Expectant* (those not expected to live long enough for evacuation). Each category of casualty is placed in a cardinal direction from the center of the CCP, with the expectant casualties removed from the view of the others. Any system will work so long as

every member of the company casualty collection team understands his part in it.

The medical platoon leader, in addition to planning for the establishment of the aid station, is also responsible for the movement and coordination of his ambulances. It is important that each ambulance team be provided with maps. Although every ambulance dispatched should have a security element to escort it to the company CCP, this is not always the case. Each medic in an ambulance needs to be prepared to move individually and be proficient at dismounted and mounted navigation.

The reconnaissance of evacuation routes, while usually possible only in defensive operations, will assist in the rapid evacuation of casualties. And a face-to-face coordination between the medical platoon leader and the company first sergeant or executive officer will ensure that the medical platoon knows the company plan, and that company leaders understand the medical platoon's evacuation plan.

The medical platoon leader is also responsible for the coordination of ambulance exchange points. These are designated points, usually on an operational

boundary, where the brigade medical support element is responsible for pushing evacuation assets forward. These points become critical during mass casualty operations, where the number of casualties quickly overloads the abilities of the battalion aid station.

Casualty evacuation and treatment are an important part of sustaining the force. The average number of died-of-wounds casualties at a combat training center is 50 percent. All of these are due to a lack of a timely evacuation or effective triage procedures.

The techniques listed here may help your unit decrease the number of its died-of-wounds casualties. Whatever evacuation and treatment technique your unit uses, it is the rehearsal, conducted to standard, that will achieve the most effective results and save the most lives.

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# Information Systems

## Let's Go Beyond Computer Literacy

LIEUTENANT COLONEL DONALD J. WELCH, JR.

Computers are everywhere. As we enter a new age—the Information Age—the magnitude of the changes we see will be similar to that of the changes when the Industrial Age replaced the Agricultural Age.

Computers and computer-related technologies are transforming the battlefield, much as the introduction of mechanization remade the battlefield earlier this

century. As we can see from efforts such as Force XXI, there are few officers today who think that computers don't have a place on the modern battlefield. One critical question is, "What does an officer need to know about computers to be successful now and in the next century?" "Computer literacy" is not enough; an officer must understand information systems.

Most officers have learned how to use computers and have become computer literate. Computer literacy means knowing how to use the tools—computers and software. A person who is computer literate can use a computer to help with many different tasks. But to thrive in the next century, our Army will need officers who know more about computer technology than just how to use a spreadsheet

or a word processor. Automated mission planning systems will be part of every unit.

Our administrative and logistics systems already rely on automation. Warfighters need to understand the systems their organizations depend on for success. They need to know the strengths and weaknesses of their units, and this includes their automated systems. They have to make decisions regarding automation from the perspective of understanding, not naivete.

Different categories of people are necessary for units to function in an automated environment—users, people on the automation staff, and unit leaders.

The users are the people who must be computer literate. They should understand their tools and how to apply them to solve the problems they face. To use a mechanization analogy, these are the vehicle drivers.

The people on the automation staff must know both the technical details and how the computers fit into the unit. They should handle all the issues involved with the unit's day-to-day computer operations. They must be computer literate only to the extent needed to help users better exploit the possibilities of the computers. In the mechanization world, these are the mechanics in the motor pool.

The leaders of the unit must be able to understand the big picture. They are the people who understand the computer systems and the way they relate to each other, the parts of the organization, and the mis-

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sion. These people do not need to be computer literate, although it may help. (The commander of a mechanized unit need not be an accomplished driver, so long as he understands what it takes to drive and how to train and employ the drivers.)

As an example, a colonel I worked for lamented that it was taking too long for us to deploy Windows on our local area

network. He questioned our efficiency by comparing our job with his experience upgrading the operating system on his home computer. He had no idea of the difference between running Windows on a stand-alone personal computer and running it on a large network with a diverse user community. Fortunately, though, he did not force us to meet his schedule; if he had, our upgrade to Windows would have been disastrous.

In this case, the leader did not need to know the details, but he did need to understand when someone explained the advantages and disadvantages of changing a system, the resources required, and the risks involved in making the change. This is an example of a computer literate officer who needed a better understanding of the way computers fit into his organization.

Can an officer function in today's Army without understanding mechanization? Even in a light unit, he has to know about fuel, maintenance, and repair parts; how best to use vehicles; how to combine vehicles with other assets; and the strengths and weaknesses of those vehicles. Much the same is true with computers. Computers are in every unit in the Army. Embedded systems are part of almost every new piece of equipment. We use computers and computer technology in garrison, and more and more systems are going with us to the field every day. Understanding automation today is becoming as critical as understanding mechanization.

A captain I worked with made a decision to move his sensitive database to a different computer without consulting any of the automation staff. He was computer literate, and he had even worked with databases on his own, and he thought he was making his database more secure by putting it on a stand-alone computer. Unfortunately, he did not really understand the trade-offs. Once I explained them to him, he realized that he had needlessly exposed his database and moved it back.

Should a captain know enough about information systems to make a decision like this without consulting the automation staff? I say yes! He is the one responsible for the database; the automation staff is just that—staff. If an officer

identifies a problem, it is his job to correct it. We must ensure that he knows enough to identify systemic automation problems and take the right steps toward fixing them.

What do I mean by *understanding information systems*? I admit it is a fuzzy

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term. Some universities have Information Technology departments. Many schools have Information Systems, Management of Information Systems, or Systems Engineering departments. The United States Military Academy has a five-course sequence on Information Systems. I don't think every officer needs a minor in information systems to be effective. Commanders in a mechanized army don't need minors in automotive engineering, but they do need to understand the fundamentals.

Today's officer needs a high level of understanding of computer technology and software and the interaction between these and the organizations that use them. He needs to know the fundamentals of databases—the different kinds, what problems they solve best, the strengths and weaknesses of each.

He must be familiar with the security issues involved with local-area and wide-area networks. He must also be conversant with the principles, the benefits, and the limitations of computer networks. He needs to understand enough about computer architecture to approve decisions on what type of hardware to buy and how this hardware can help the unit's mission. Today's officer needs to know enough about software engineering to understand what reliability in software really means—particularly when dealing with mission critical systems.

This is not the kind of understanding that you get from knowing how to make great charts on a computer. When your unit is about to fly off to a conflict and every pound of weight and every cubic foot of space counts, you need to decide

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how important your back-up automated mission planning system is to your unit's success.

Computer literacy is being taken out of most Army courses. This is not a bad idea, since most officers today come out of college knowing how to use computers. But in the place of computer literacy, schools must teach information systems. Just as the necessary mechanization topics are taught in branch officer basic courses, the beginnings of education in information systems must also be taught there. An officer's information systems education must then continue at every military education level, because the years between the courses can mark large advances in computer technology. In addition, higher level headquarters use information technology differently and more extensively than lower level headquarters. As an officer is being prepared for higher level staffs, he needs additional

education in information systems. For example, command and staff courses prepare officers for staff duty at division and corps levels. The understanding of information systems required by a corps staff is different from that required at brigade level, which is taught at branch ad-

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vanced courses. The service schools should reflect this difference when teaching information systems.

This will require changes in the schools. We don't have enough system automation officers (Functional Area 53) to meet all the Army requirements now. Although system automation officers may not even be the best choices for instructors, the Army does not have a large

pool of instructors available to teach these topics in service schools and courses.

As the battlefield changes, the Army is relying on more and more automation. The officer corps must understand the big picture when dealing with the integration of computers into organizations. This level of understanding cannot be learned through computer literacy programs. An officer must receive an information systems education that spans his entire career. He cannot rely completely on an automation staff, especially on a topic that touches almost all aspects of his command.

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# Chemical Company Support To Light Infantry with Non-Lethal Weapons

**CAPTAIN RUSSELL A. FLUGEL**

The U.S. Army Chemical Corps currently supports the Army's light infantry divisions (including airborne and air assault) with dual-purpose (smoke and decontamination) companies. It will always be essential that the Chemical Corps be prepared to support decontamination contingencies, but light division smoke support requirements are becoming increasingly limited.

As the Army redefines its role for the 21st century through the Force XXI concept, the Chemical Corps must make appropriate changes at the lowest level to support the redesign of the division as the central element of strategic land power. The best way for the Chemical Corps to secure a future role in support of the Force

XXI light division is to augment the current mission of dual-purpose chemical companies with the offensive capability of non-lethal weapons.

Because of the constraints involved with rapid strategic mobility, light divisions set their deployment priorities according to the level of threat. Since light division missions increasingly involve low-intensity conflict (LIC) or operations other than war, chemical companies often find themselves at the bottom of the division's deployment priority list, or not on it at all. The reason for this is that smoke offers no offensive capability and is seldom essential to light division missions. Outside of conventional operations, there are few smoke requirements

in light divisions that cannot be met by smoke pots or grenades. Non-lethal weapons, however, represent an essential offensive alternative for light infantry commanders as they prepare for more LIC missions in the 21st century.

The Army is already making the transition to the Force XXI concepts of power projection and broad-range missions, and many of these missions belong to the light divisions. It is clear from past operations that these types of light division missions do not require smoke.

The most recent example is Operation Uphold Democracy in Haiti, in which the benefits of non-lethal, crowd control assets outweighed those of smoke. During the 82d Airborne Division's September