

Information Resources Management: The Key to Effective Government and National Security

By Mary Linda Polydys and Daniel J. Ryan

The Office of Management and Budget says, "Government information is a valuable national resource. It provides the public with knowledge of the government, society, and economy -- past, present, and future. It is a means to ensure the accountability of government, to manage the government's operations, to maintain the healthy performance of the economy, and is itself a commodity in the marketplace." (Cir. A-130, §7b) The global information infrastructure that supports much of the world's prosperity and improved living standards also brings challenges. "These new flows of trade, investment, information and technology are transforming national security." (National Security Strategy of the United States of America, p. 47) Thus, managing national security in the information age requires efficient and effective management of information resources, including management of the security of the information infrastructure.

The Information Resources Management (IRM) College provides the advanced education needed for effective information management, and prepares senior military officers and

government leaders to manage the information assets vital to our economic prosperity and national security by employing information and information technology as instruments of national and economic power.

It is clear that information is a key element of modern warfare, and that fighting forces that do a better job of collecting, managing, analyzing and

"Information is as important in the global war on terrorism as bullets and bombs."

using information are more likely to accomplish their missions than those that fail in these critical tasks. Whether the mission is combat, nation building, peacekeeping, or humanitarian assistance and disaster relief, information superiority is a force multiplier that contributes directly to mission assurance. The QDR 2006 Report states, "Technological advances, including dramatic improvements in information

management and precision weaponry, have allowed our military to generate considerably more combat capability with the same or, in some cases, fewer numbers of weapons platforms and with lower levels of manning." (p. v) Advances in targeting and guidance that make precision weaponry possible are, of course, based on information technologies and the effective management of those technologies.

Net-centric warfare combines powerful military forces with superior information management, enabling the precise application of force and reducing the likelihood of casualties in coalition forces and non-combatants. Department of Defense doctrine recognizes the criticality of information management for mission success, and even beyond net-centric warfare: "Aggressive information management on an international level is absolutely necessary in influencing world political opinion and legitimizing US efforts in [Military Operations Other than War]." (Joint Pub. 3-07 p. II-8)

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Information Resources
Management College

The IRM College is a global learning community for government's most promising information leaders.

National Defense University

Information Resources Management (cont.)

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Civilian departments and agencies also depend on information management to accomplish their duties in governing the nation. OMB Circular A-130 states, “The Federal Government is the largest single producer, collector, consumer, and disseminator of information in the United States. Because of the extent of the government’s information activities, and the dependence of those activities upon public cooperation, the management of Federal information resources is an issue of continuing importance to all Federal agencies, State and local governments, and the public.” (§7a) Whether departments and agencies are collecting and analyzing data in support of their mission, processing records for internal management, or disseminating information to the public, information is the raw material from which understanding and, ultimately, control are fashioned. Compiled, analyzed, considered and reported, information is an asset and a currency of exchange. As ideas and concepts it is the intellectual capital that shores up our economic system and our way of life. Excellence in management of information resources is therefore necessary for sound and effective government.

Information assurance is an enabling discipline for information management. “Because the public disclosure of government information is essential to the operation of a democracy, the management of Federal information resources should protect the public’s right of access to government information.” (OMB A-130, §7f) Failure to maintain the confidentiality, integrity and availability of sensitive information has economic, political and social consequences. Because information has value, it is a target for spies and thieves. Properly and competently managing information resources ensures that our computers, networks and information systems are designed, implemented and operated so as to ensure that only authorized persons can gain access to sensitive data, or can modify or destroy information assets. No one understands the importance of information assurance better than the Department of Defense. The lessons of Antietam, Tannenberg and Midway,

where information security failures and their successful exploitation by the opposing side shaped the course of world history, are well-remembered in DoD and shape decisions for future investments. Accordingly, the Department will “make additional investments in information assurance capabilities to protect information and the Department’s computer networks.” (QDR 2006 Report, p. 50) The Department will “strengthen its data strategy – including the development of common data lexicons, standards, organization, and categorization – to improve information sharing and information assurance, and extend it across a multitude of domains, ranging from intelligence to personnel systems.” (QDR 2006 Report, p. 59)

Since all of the critical infrastructures which are essential to our economy and our national security depend upon the effective and efficient functioning of the information infrastructure, managing information resources is an essential part of our overall effort to protect the nation and ensure its prosperity. (National Strategy to Secure Cyberspace, p. vii) The Department of Homeland Security, in its National Infrastructure Protection Plan, recognizes the importance of information management to prevention of, preparation for, response to, and recovery from incidents that threaten the nation. (Revised Draft v2.0, p. 84)

“Users of Federal information resources must have skills, knowledge, and training to manage information resources, enabling the Federal government to effectively serve the public through automated means.” (OMB A-130, §7n) The Information Resources Management (IRM) College responds to these imperatives by providing graduate-level courses and Professional Military Education in programs that prepare government executives and senior military officers to direct and manage the information component of national power by leveraging information and information technology for strategic advantage.

Battle-Wise Decision-Making: Integrating Intuition and Reasoning in Action

By David C. Gompert, Irving Lachow, and Justin Perkins

This article is an excerpt from the book “Battle-Wise” which is available from NDU Press. Dr. Lachow is with the Information Resources Management College and Messrs. Gompert and Perkins were with the Center for Technology and National Security.

A thread that connects key cognitive abilities is the capacity to learn in action. Because of its intensity and tempo, warfare generates information rapidly, and networking accelerates it. Combined with the messiness and ambiguity of combat, this rapid flow of information can cause confusion or, in military vernacular, “fog.” At the same time, being able to think, decide, and act quickly has obvious advantages. This underscores both the importance and difficulty of balancing the value of solid and complete information with the need to be decisive. Again, time-information shows its significance. Deferring decisions until all useful information is available and analyzed can make a force too slow. Yet making irretrievable judgments with deficient information can lead to casualties and calamities. Decision-making depends heavily on the balancing and management of time and information. Battle-wisdom must apply not only to people but also to how those people make decisions.

In networked warfare, decision-making should be based on:

- ◇ Knowing what can and must be decided, and when
- ◇ Making provisional decisions pending more information
- ◇ Using provisional decisions to gain time and information (or time-information)
- ◇ Re-visiting decisions as more information is harvested.

Such an approach can be at once both expeditious and thoughtful. Done right, it can master the urgency of war without compromising performance by either haste or delay. It can expand the room for reasoning—relying mainly on intuition when a challenge suddenly arises, but then shifting toward reasoning as time and information are gained by provisional decisions and actions. With battle-wise decision-making, the war-fighter times and tailors choices to take account of his or her need and opportunity to learn in action. While learning occurs, the war-fighter can confirm, improve, alter, or even reverse provisional decisions. Just as the ability to adapt rapidly is a key strength of the battle-wise war-fighter, the practice of learning in action is a key feature of battle-wise decision-

making.

While learning under time pressure may sound straightforward, learning while fighting is exceedingly hard and potentially hazardous if it slows action. Warfare and reflection are uneasy companions. Yet battle has no substitute when it comes to the opportunity to learn about both the opposing force and one's own force. As coaches and players do during an American football game—also dynamic, messy, violent, and networked—the battle-wise decision-maker starts with a flexible plan based on prior experience and analysis and, as the situation unfolds, decides what orders to execute based on what he or she learns from the action. Neither a rigid plan nor pure intuition will do. Just as battle plans may not survive beyond initial contact with the enemy, learning lessons need not await the end of hostilities.

In recent years, researchers at the Santa Fe Institute and RAND Corporation have formulated important precepts and championed useful planning methods based on the belief that complexity and uncertainty are best addressed by adaptive preparation for the long-term future. The underlying idea is to understand what one *must and can* decide, depending on urgency and available information, while playing for time and seeking more information to improve the quality of one's decisions. The same approach, drastically compressed in time, should underpin battle-wise decision-making. Mastering it could provide stunning operational and enduring strategic advantages.

Again, both intuition and reasoning are indispensable in overcoming the pressure, urgency, and messiness of warfare in the information age. Sensing a threat or an opportunity, initial action may be based on what experience says ought to work, but should also aim to gain both information and time. As this action clarifies conditions and buys time, structured reasoning becomes more possible, leading to a refined or revised course of action after examination of options. Along the way, the decision-maker looks for signs that should appear if preceding assumptions and judgments were correct. Not seeing these signs may signal that a course correction is needed. Meanwhile, information can be used to refine understanding and adjust accordingly. Eventually, with time and information now on the decision-maker's side, sound and superior reasoning can lead to success.

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Battle-Wise Decision-Making (Cont.)

Condition 1	Condition 2	Condition 3	Condition 4
Limited grasp of the problem	Clarification of the problem	Comprehension of the problem	Complex solution
Urgent	Less time pressure	Little time pressure	No time pressure
Little information	Limited information	Abundant information	Complete information
Act to create options	Act to gain advantage	Act to gain dominance	Succeed
Move in general direction	Refine or alter direction	See desired end state	End state
Intuition-heavy	Intuition & Reasoning-lite	Reasoning & Intuition-lite	Reasoning

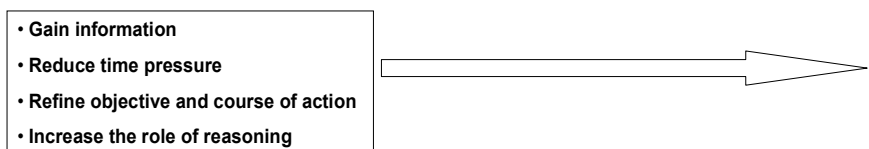


Figure 1: Battle-wise Decision-making Process

This decision-making process is depicted in Figure 1, in which confidence increases with the passage of time, from left to right. The four distinct conditions shown are somewhat artificial; in reality, the process is more seamless. At any point in the process battle-wise decision-making should offer major advantages, all else being equal, over opposing forces that are guided by decisions dictated by either haste or undue caution.

One of the keys to integrating intuition with reasoning is the “self-awareness” of the decision-maker. Knowledge of the origins, assumptions, biases, and limits of one’s mental models and experiences can help answer the question: Does my intuition apply to the situation I face? If the answer is affirmative, intuition may be a reliable basis for deciding -- at least provisionally. But if there is no suitable mental model or body of relevant experience, more information should be sought and analyzed before making a decision. Even then, in extremis, intuition may be helpful to borrow some time.

Because people who must act with little time naturally favor intuition over reasoning, a conscious intervention—verbalizing the applicability question—may be needed to avert mistakes when intuition is inadequate or misleading. The individual must be able to determine dispassionately whether his or her stored models apply. Such disciplined

and objective self-awareness is hard for most people, but it can be cultivated.

Battle-Wisdom in Practice

In warfare, the ability to make sense of overflowing streams and swirling currents of information is already critical and will become more so. Networking provides rich but also potentially confusing information. To some extent, the richness can be exploited and the confusion reduced by technologies that sort, distribute, and display data. Although this may serve up better information, it does not assure its effective use. This is why one of the prerequisites of battle-wise decision-making is the practical implementation of smart-pull.

In practice, it is far more difficult to satisfy via the smart-pull method the information needs of a war-fighter than those of, say, the average Internet user. In the first place, knowing what information to post on a military network implies knowing all facets of all predicaments and opportunities a war-fighter—for that matter, *all* war-fighters—may face and thus what information might be helpful. Even then, the war-fighter will not know of all the relevant information that could be pulled. The image of the commander of a unit under surprise attack having to browse the operations network for useful data, as one would look for cheap flights or long-lost classmates, is hardly comforting. So the expectation that a local decision-maker will, in fact, have all useful information requires a great deal of faith or else investment in network development aimed at providing decision-makers with useful information in a usable form at the right time.

Although network development to this end is beyond this volume’s scope, it is obviously important and for military networking, hardly straightforward. Even “smart” users trying to pull information from networks are hindered by chaotic, messy conditions and time constraints. To be effective in operations, the design and operation of networks must take account of the predilections, culture, habits, nomenclature, and contingent needs of myriad users under myriad conditions. Even then, the value of data can be undermined without the situational context of a problem, which in military operations may be unforeseeable. Finally, the requirements and efficacy of network capabilities vary with the decision-maker’s experience. Experienced individuals know what information to select, have a more coherent mental organization of information, recognize what

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information is missing, and are able to adjust decisions to compensate for incomplete information. Yet no condition could be less amenable to the orderly use of networking than combat. A war-fighter engaged with an enemy is not, and probably could never be regarded as, the equivalent of an ordinary Internet user.

Under current conditions, senior commanders can have remarkably comprehensive information displayed in exquisite detail before them. But whether they have the necessary confidence in subordinates to delegate authority and the self-discipline to resist micro-management, despite these seductive displays, remain important open questions. Of course, confidence must be earned. The subordinate must be not only battle-wise but also willing to take responsibility for the consequences of his or her decisions—to be a leader-in-action, if not in pecking order.

Until enough tactical-level officers are sufficiently battle-wise to make good use of the information from the network, senior commanders will understandably be reluctant to delegate and tempted to micro-manage. For tough decisions, a good leader would rather risk making a mistake and “taking the fall” than having a subordinate do so. While other military cultures have long stressed decentralized operational decision-making, U.S. senior officers likely will set the bar high for battle-wise juniors to earn such authority.

In theory, battle-wisdom demands the integration of intuition and reasoning, self-awareness, the abilities to anticipate, decide quickly, seize opportunities, and adapt in action, and the willingness to lead and learn. In practice, it also depends on implementation of the smart-pull principle, good information management (IM), and delegation of authority.

An Illustration

The following example may illustrate these factors at work: imagine a motorized column of peacekeepers is ambushed as they move through a remote province of an African country engulfed in tribal violence. Imagine that this unit is networked for their mission with other nearby patrols, sensor-carrying drone aircraft, an attack-helicopter unit, a provincial operations coordination center, force headquarters, and an intelligence fusion facility. Now visualize the major in command of the ambushed column being not at the network's extremity but at its center. Assume that good IM is in place, and that this battle-wise officer is trained to know what information to pull from the network, including intelligence about the threat, the latest data on the non-combatants to be rescued, weather reports, and informa-

tion about the availability of back-up forces.

Senior officers up the chain of command feel the major has earned their confidence, and they appreciate that he has a fuller immediate view than they, thanks to his tacit knowledge, of unfolding events. Therefore, within the unit's stated mission and rules of engagement, the major has the authority to decide how to respond and what support to request. If it were possible that a wrong decision by the major could jeopardize not only his own unit and mission but also the larger operation or other units, an over-riding decision by higher command might be indicated. This often will be the case, given the ease and speed with which word of the unit's fate is shared with the outside world. But in this example, the assumption will be that the major's chosen course of action, whether right or wrong, will not have major ramifications beyond his unit and its results. He is thus inside his envelope of discretion.

Depending on what the major senses and summons from experience, his initial choice may be simply to hunker down or pull back. His intuition may tell him that the option of attacking the ambushing forces is not viable because his experience and mental model suggest that an inferior force would not have attacked him. Once he has more data via his network about the threat, the presence of innocent civilians, and the time it will take to be reinforced, the major can weigh and decide among several options: to engage in a fire-fight; wait for reinforcement before engaging; retreat; or attempt to slip the ambush and proceed with the original assignment. While he may get advice from headquarters, the major is best placed to determine what is happening, what information and help is needed, what options are available, and what risks exist. The critical question then becomes how, and how well, he selects the best course of action. While vital, intuition will get the officer only so far before he must analyze all available information and weigh his options.

The major's self-awareness establishes that his intuition is reliable enough to tell him not to attack, but only that. Identifying, weighing, and selecting among options beyond “don't attack” requires more information and more time, which he gains by holding his ground. Thus, his intuition can be trusted to give a good-enough initial response as well as secure him time to pull information from the network to aid in making a more reasoned decision.

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Improving Performance Effectiveness through Leadership and Management Education (Part 2)

By Dr. William S. Boddie

This article contains extracts from Dr. Boddie's recently approved Doctor of Management in Organizational Leadership Program research dissertation. In the previous issue of Info Trends, the research problem and method used to collect the research data were covered. Here, in part two, the themes and recommendations that emerged from the study are discussed.

Themes

The following six core themes were identified that resonated, in varying degrees, throughout much of the interview dialogue: (a) transformational leadership, (b) communication, (c) organizational impact, (d) Business Information Technology Management (BITM) Certificate Program significance, (e), project management, and (f) recommended BITM Certificate Program improvement.

Theme 1: Transformational Leadership

Transformational leadership emerged as a core theme in the analysis of the data collected from the participants. Eighteen (90%) of the 20 participants explicitly discussed transformational leadership as a key IT leadership competency they gained from their BITM Certificate Program experiences. These 18 participants described transformational leadership as a situation in which the leader demonstrates vision, inspiration, and empowerment. The participants described transformational leadership as an approach for leaders seeking to help their organizations realize long-term organizational performance effectiveness goals and objectives. The participants further described how they used the transformational leadership competencies they gained from the program to help their organization improve its performance effectiveness.

Sixteen of the 18 participants (89%) who described transformational leadership also described how they used vision as a leadership competency in their business environment as a result of their BITM Certificate Program participation. The participants described vision as the ability to develop a clear and compelling view of the direction in which the organization should be headed. The participants also described vision as the

leader's ability to understand where the organization is today, where the organization can be in the future, and how the organization can transition from its current state to the future desired state. The participants described how they adopted this critical transformational leadership competency to help their organizations improve their performance effectiveness. The participants described how the BITM Certificate Program provided them a deep understanding of the visionary characteristic of transformational leadership.

Sixteen of the 18 participants (89%) who described transformational leadership also described empowerment as a critical transformational leadership competency. These participants described empowerment as the transformational leader's ability to ensure that his or her followers have the resources and support they need to accomplish the leader's vision. The participants described empowerment as the leader providing financial, human, and institutional resources for his or her followers. The participants also described leadership empowerment as listening to, encouraging, and providing emotional support for their followers. The participants provided rich descriptions of how they empowered their followers and helped their organizations improve in performance effectiveness based on the leadership competencies they gained from their BITM Certificate Program experiences. Ninety percent of the participants reported that the BITM Certificate Program prepared them with transformational leadership competencies.

Theme 2: Communication

The participants described effective communication as a critical IT leadership competency they gained from their BITM Certificate Program experiences. Each of the 20 participants (100%) described communication as the ability to communicate key information to the organization's followers. All participants provided rich descriptions of how they used communication in their business environment as a result of their program participation to help their organization improve its performance effectiveness. The participants described their experiences in communicating in one-on-one situations, in small

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groups, and in larger organizational settings. The participants described how they developed communication plans and communicated through visual approaches such as placing key organizational themes on coffee mugs, computer mouse pads, and on small trinkets. One hundred percent of the participants reported that the BITM Certificate Program prepared them with communication competencies.

Theme 3: Organizational Impact

Each of the participants (100%) reported that the BITM Certificate Program enabled them to have a significant and positive impact on their organization. The participants provided rich descriptions of the impact they had on their organization as a result of their program experiences and reported that their program participation enabled them to help produce the outcomes their organizations expected from their IT investments. The participants described many successful programs, projects, and initiatives they led, managed, or had a significant role in leading or managing as a result of the IT leadership and management competencies they gained from their BITM Certificate Program experiences. The participants described the BITM Certificate Program as significant in enabling their effectiveness to lead and manage these programs, projects, and initiatives.

Theme 4: BITM Certificate Program Significance

Nineteen of the 20 participants (95%) reported that the program was significant in helping them better understand leadership. These participants reported that they had a general understanding of management before completing the program; however, after completing the program, they described a significantly more profound understanding of and appreciation for leadership than they possessed prior to completing the program. These participants also provided rich descriptions of how the program helped them to better understand and apply effective leadership competencies in their organizations.

Theme 5: Project Management

Eighteen of the 20 participants (90%) described project management as a competency they gained from their participation in the program. The participants described

how the program prepared them with competencies in developing project management plans; developing work breakdown structures; monitoring the cost, schedule, and performance of projects; and implementing risk and communication management competencies. Each of the 18 participants (100%) described projects in which they were successful in managing as a result of the project management competencies gained from the program. These participants provided rich descriptions of how they used the project management competencies gained from the program to help their organizations deliver projects that met the development performance, cost, schedule, and outcome expectations.

Theme 6: Recommendations to Improve BITM Certificate Program

Fourteen of the 20 participants (70%) suggested opportunities to further improve the BITM Certificate Program. These participants recommended the program be further improved by offering the program online, offering the program on-site, developing an advanced follow-up program, incorporating end of course examinations, increasing the time for each class session, offering more hands-on experience, and offering an IT leadership certification program. Six participants (30%) described the program as being sufficient in its current state.

The data from the study suggest that the BITM Certificate Program prepares the participants with significant IT leadership and management competencies. The participants used the competencies gained to help their organizations produce the outcomes expected from their IT investments. The participants also used the competencies to help their organizations improve in performance effectiveness.

Recommendations

Little research has been conducted that explores how IT leadership and management continuing education certificate program prepare IT leaders and managers with leadership and management competencies. This study explored how the BITM Certificate Program prepared IT leaders and managers with leadership and management competencies. Although the study partici-

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Participants reported that the program prepared them with IT leadership and management competencies, further research should be conducted to add to the body of knowledge.

Researchers should conduct studies that explore how or that measure the degree to which IT leaders and managers are prepared with IT leadership and management competencies before participating in the BITM Certificate Program. The researchers should then explore how or measure the degree to which the program prepared the participants with IT leadership and management competencies after completing the program. These studies might provide data regarding the IT leadership and management competencies the IT leaders and managers have before and after participating in the program. Another recommendation is to conduct studies that expand the study participants to include the BITM Certificate Program participants and their supervisors. These studies might provide meaningful data regarding how the program prepared the participants with IT leadership and management competencies from the participants' perspective and from the perspective of those who supervise the participants.

A final recommendation is to conduct studies that explore the perceptions and perspectives of those who are led by BITM Certificate Program participants. These studies would seek to explore how the program participants lead and manage IT environments from the perspective of those who are led by the program participants. These studies might provide meaningful data regarding the impact the program participants have on those they lead after completing the program.

Transformational leadership...a situation in which the leader demonstrates vision, inspiration, and empowerment.

Vision...the ability to develop a clear and compelling view of the direction in which the organization should be headed.

Empowerment...the transformational leader's ability to ensure that his or her followers have the resources and support they need to accomplish the leader's vision.

Leadership empowerment...listening to, encouraging, and providing emotional support for their followers.

Multimedia in the US Army

Col Ronald E. Seldon, "Applying Multimedia Technologies" elective and ICAF student

"Technology is a way of organizing the universe so that man doesn't have to experience it."

Max Frisch -- May 15, 1911 – April 4, 1991

Introduction

The United States Army is increasingly demonstrating an inextricable link to the world of information technology and ever-growing efficiency through multimedia technologies. The environment in which we routinely find ourselves operating – while in garrison and deployed – reinforces the practicality of using multi-media technology to get information out to those that need it. It also empowers us to allow authorized individuals to receive or access information spanning all levels of classification twenty-four hours a day, seven days a week. This article explores current and potential applications of multimedia technology in the United States Army.

Information technology is a critical part of the U.S. Army's means of informing and communicating both internally and with the rest of the world. Continuing efforts to remain current and relevant in the increasingly sophisticated world of communication and information management have prompted dramatic changes in the way organizations are structured, manned, and the processes and procedures used to conduct business.

Multimedia technology is elevating our potential to the next level. Enhanced multimedia technologies are vastly contributing to unit effectiveness and efficiency across the spectrum of operations. They are also responsible for many of the transformational initiatives already implemented or planned for execution. It is vividly clear that those same capabilities are contributing directly to the morale, welfare and well-being of soldiers, civilians and their families.

Applicability

Multimedia technology greatly contributes to information sharing in our administrative or garrison environment; in a readiness or training context; and in operational or tactical applications. While tremendous opportunities have been realized in each, significant potential for advancement exists across the board.

Administrative/Garrison Applications

The contributions multimedia technology makes to U.S. Army day-to-day administrative and garrison information requirements simply cannot be overstated. A wide range of indispensable information sharing tools significantly enhanced through the integration of multimedia tools is readily available. Many are so well integrated, they are transparent and largely taken for granted by casual users. Here are highlights of the more critical and widely used tools.

Army Knowledge On-Line. The Army's official website, "Army Knowledge Online", is designed and intended to serve as the individual soldier's access point for numerous soldier support, training, readiness and general information conduits. From this location, soldiers can access their military and pay records, promotion and selection files, .mil email account, assignment opportunities, and links to numerous other professional topics in various multimedia formats. It is programmed to receive additional features with expanded performance parameters. It will then support a paperless evaluation system and the capacity for soldiers to review their complete promotion file, including the official photograph, enlisted/officer record brief (ERB/ORB) and all official documents as a .pdf file. It will also have the functionality to support electronic submissions to update and request corrections to the file upon review. Additionally, soldiers can obtain an AKO-S (secret/secure) account for automated classified information access and secure email connectivity.

"Army Stand-To" Daily Email Distribution List. The "Army Daily Stand-To Article" is an example of one of the Army's official bulk email distribution list designed to provide wide circulation of current topics of broad professional interest to an expanding audience-base. It also contains links to other information sharing opportunities in a number of different mediums. It contains stories from the major international news agencies, blog links, and even Pentagon features, such as the "Pentagon Report - CSA Structure Brief."

Unit, Installation and Family Support Information. The Army is increasingly augmenting traditional information sharing means (e.g. face-to-face, newsletters, bulletin boards, etc) with automated tools. Unit and installation websites are growing in popularity and are really the norm rather than the exception. Multimedia technology has exponentially in-

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Multimedia in the US Army (Cont.)

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creased the functionality and usefulness of those websites. Organizations can better share information with soldiers and their family and provide them with a better feedback mechanism.

Readiness or Training Applications

Multimedia technology affects the way we collect, store, process and disseminate data and information. It also significantly enhances our capability to sort, analyze, and coherently present information in a format that is both useful and practical.

Readiness Tools. Unit status reporting and various supporting elements have been tremendously streamlined through the use of software applications that use spreadsheet data to update and display visual presentation slides traditionally done in PowerPoint or a similar format. Other spreadsheet and database management tools calculate and display information based on selected parameters. Some accurately depict when soldier readiness qualifications (such as medical and dental treatments) require attention. They provide units with the opportunity to forecast and program opportunities to address readiness and deployability requirements.

Training Tools. A wide variety of training applications have multimedia technology implications. In many cases, they provide cost saving or parallel training opportunities to enhance the overall training experience.

One common example is the unit marksmanship training device. This is a simple multimedia system that incorporates a laser equipped rifle, computer and video display to simulate an individual weapon qualification firing battery over conditions similar to those on a live fire range. The system records the soldier's performance and provides visual feedback indicating potential points of strength or weakness.

Many standardized, recurring individual or collective training requirements can be conducted on web-based programs. Annual anti-terrorism (**Antiterrorism Level 1 Training System** website) and security awareness training requirements are traditionally executed in a web-based format. It is a relatively low-resource, intensive method that efficiently allows soldiers to obtain training and subsequent testing in an environment conducive to progressing at their appropriate individual pace. Through automated reporting of the completion of training and testing, unit trainers can maintain and track current training statistics practically real-time.

Operational and Tactical Applications

Operational Tools. Individual or group capacity to maintain operational currency rests largely on unimpeded accessibility to relevant information. While a great deal of information is available through open, public sources (like CNN, MSNBC, etc), a tremendous amount of very specific mission-oriented information is available only through private sources. Pentagon briefings, like "Current Operations - Iraqi Special Police Commandos Brief", are a prime example. Web-enabled viewing affords appropriate viewing of that type of material at the customer's convenience.

Tactical Tools. The Army thrives on multimedia technology designed to provide commanders and staffs with uncompromising levels of situation awareness. Leaders demand the full spectrum of available resources to communicate, conduct force tracking, and visualize the battlespace. Commanders have grown to expect, as a minimum acceptable standard, to have tactical displays that integrate updated map data, GPS enabled force locational data, near real-time imagery and unit status information. The use of digital imagery and streaming video is growing increasingly prevalent at lower levels of command. Improved tactical communications, including video teleconferences and secure video teleconferences, allow commanders and staff to share multimedia enhanced video and audio information exchanges routinely.

Conclusion

Information technology is a critical part of the U.S. Army's means of informing and communicating, both internally and with the rest of the world. It is apparent that multimedia technology greatly contributes to the Army's information sharing in an administrative or garrison environment; in a readiness or training context; and in operational or tactical applications. While tremendous opportunities have been realized in each, significant potential for advancement exists across the board. Continuing efforts to remain current and relevant in the increasingly sophisticated world of communication and information management have prompted dramatic changes in the way organizations are structured, manned, and the processes and procedures used to conduct business. The United States Army is increasingly demonstrating an inextricable link to the world of information technology and ever-growing efficiency through multimedia technologies. The environment in which we routinely find ourselves operating – while in garrison and deployed – reinforce the practicality of using multi-media technology to get information out to those that want or need it.

Battle-Wise Decision-Making (Cont.)

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The illustration shows, again, that the most precious commodities in situations of urgency and complexity, like warfare, are time and information. Yet the case reminds us that time and information often work against one another: the greater the haste, the less chance one has to process data and to reason, thus forfeiting the benefit of information technology (IT). Lack of time means lack of information, and lack of information means dependence on experience and mental models, which may not be appropriate or sufficient to the unfamiliar problem at hand. How-

failure; the blending of intuition and reasoning; rapid adaptive decision-making; or the distribution of authority to go with the distribution of information. More generally stated, *once two competitors have both crossed a certain threshold of networking, their comparative ability to achieve better cognition and decision-making does not directly depend on their economic, technological, or military resources.* Shrewd, adaptable, and strongly motivated adversaries, whether technologically sophisticated or not, could be competitive with the United States in each of these elements.

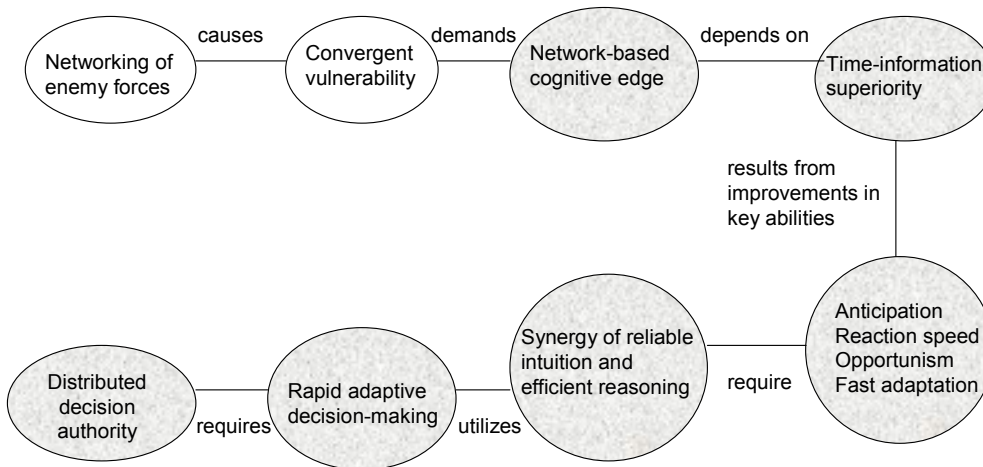


Figure 2: The Battle-Wise Process

ever tolerable in routine problem-solving, this time-information problem must, and increasingly can, be overcome when lives depend on solving complex and unfamiliar problems.

Summing-Up Battle-Wisdom

Now that we have examined the need for battle-wise people and decision-making, in strategic as well as operational terms, and before looking at how to foster these abilities, it is useful to tie together the concepts at play. Figure 2 presents a schematic of battle-wisdom at work, from the operational conditions that demand it, the abilities that comprise it, the traits and conditions that foster it, and its pay-off in networked warfare.

Note that once enemy forces are able to achieve networking and make U.S. forces vulnerable, U.S. forces are not necessarily guaranteed advantages in: cognitive qualities; the ability to gain time-information advantage; the specific capabilities that may determine operational success or

The implication of this is that *the United States must fashion and follow a strategy to achieve battle-wisdom superiority that does assume an advantage in initial conditions.* To mix athletic metaphors, cognitive competition in the military domain is a “new ball game” on a “level playing field.” Therefore, the U.S. strategy must not be a mere extension of efforts already underway to create net-centric forces but instead an explicit and comprehensive plan to compete and win at the next, higher level.

Has the U.S. Military Grasped the Need for a Strategy?

Because sound thinking and decision-making are not just details of network-centric capabilities, and because success in competition on the military cognitive plane will not necessarily follow success on the technical plane, what is needed is a strategy to build battle-wise forces. Do the makings of such a strategy now exist?

Readings of the latest *National Military Strategy of the United States of America* suggest that the answer is a qualified “no.” Here are germane excerpts from that document:

Decision superiority—the process of making decisions better and faster than an adversary—is essential to executing a strategy based on speed and flexibility. Decision superiority requires new ways of thinking about acquiring, integrating, using and reconnaissance assets that provide knowledge of adversaries. Decision superiority requires

(Continued on page 12)

Battle-Wise Decision-Making (Cont.)

(Continued from page 11)

precise information of enemy and friendly dispositions, capabilities, and activities, as well as other data relevant to successful campaigns.

Battlespace awareness, combined with responsive command and control systems, supports dynamic decision-making and turns information superiority into a competitive advantage adversaries cannot match.

Persistent surveillance, ISR management, collaborative analysis and on-demand dissemination facilitate battlespace awareness. Developing the intelligence products to support this level of awareness requires collection systems and assured access to air, land, sea and space-based sensors.

Decisions to apply force in multiple, widely dispersed locations require highly flexible and adaptive joint command and control processes. Commanders must communicate decisions to subordinates, rapidly develop alternative courses of action, generate required effects, assess results and conduct appropriate follow-on operations.

A decision-superior joint force must employ decision-making processes that allow commanders to attack time-sensitive and time-critical targets. Dynamic decision-making brings together organizations, planning processes, technical systems and commensurate authorities that support informed decisions. Such decisions require networked command and control capabilities and a tailored common operating picture of the battlespace.

These passages tell us there is a general awareness of the growing operational and strategic importance of something called “decision superiority,” which has some but not all of the elements of the superiority in cognitive capacity and performance that we call “battle-wisdom.” It also tells us

that “responsive” command and control systems, collaborative analysis, and on-demand dissemination of information are important to decision superiority. This is encouraging.

However, this official explanation of what is required for decision superiority fails to mention people, how they think, and how well they decide. It is as if battle-wisdom—the capacity to integrate reliable intuition and rapid reasoning and the abilities to anticipate, decide quickly, seize opportunities, and learn in action—are assumed, needing only better intelligence sensors, information networks, and processes to succeed. It calls for commanders to communicate their decisions to subordinates, without recognizing that the subordinates may well be better informed than their superiors to decide what to do. After all, the great virtue of networking is not that it enables commanders to promulgate orders but that it informs those “on the edge” and permits them to collaborate, accept responsibility, and take initiative.

The key to decision superiority lies not in the information network behind the screen but in the human brain behind the eyes looking at the screen. If the United States expects to lead on the cognitive plane the way it has led on the technological plane, it would do well to begin with a basic understanding of the difference between the two.

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