

RETHINKING IO

COMPLEX OPERATIONS IN THE INFORMATION AGE

Brigadier General Huba Wass de Czege, U.S. Army, Retired

OPERATIONAL PARADIGMS that might have seemed sensible 15 years ago confuse more than clarify today. In the years just prior to 11 September 2001, a new “American way of war” emerged to replace Cold War paradigms—those underlying, reflexive ways of thinking embedded in our

doctrines. What emerged was a conceptual shift dubbed “Rapid Decisive Operations” (RDO). RDO rested on these pillars: An Air Force and Navy capable of controlling air, space, and sea domains from which to coerce enemies with a hail of precise air and naval missile power; increasingly more capable special operating forces to penetrate enemy territory and provide targets; and a new core capability called “information operations” (IO) to “influence, disrupt, corrupt or usurp adversarial human and automated decisionmaking, while protecting our own.” In this IO domain, as in the others, the term most used in the late 1990s to describe the product of American technological superiority was not just superiority, but “dominance.” RDO asserted that leveraging these asymmetric superiorities would not only conserve scarce ground forces and reduce casualties, but they would also achieve rapid and decisive results. As we saw versions of RDO applied in Kosovo in 2000, in Afghanistan in 2002, and in Iraq in 2003, it became clear to most professionals that this new paradigm oversimplified complexities then not well understood. In fact the chief failing of RDO was an utter lack of respect for the difficulty of what it set out to do: either to achieve *relevant* dominance in any sense, or to coerce any determined adversary to undertake any actions whatsoever. Even denying an adversary the ability to coerce or attack its neighbors has to be approached with humility today.

The IO component of this package has remained the most resistant to revision. Two prized and related tenets have proven especially intractable. The first of these tenets is that “the integrated employment of the core capabilities of electronic warfare, computer network operations, psychological operations, military deception, and operations security, in concert with specified supporting and related capabilities” is the best way to gain the maximum benefit of so-called IO core, supporting, and related capabilities. The other is that when these capabilities are thus integrated, an independent IO “logical line of operations” (LLO) can influence the behaviors of adversaries (and the populations that support them) with so-called “information effects” alone.



Brigadier General Huba Wass de Czege, U.S. Army, Retired, was one of the principal developers of the Army's AirLand Battle concept and the founder and first director of the School of Advanced Military Studies, Fort Leavenworth, Kansas. He holds a B.S. from the United States Military Academy and an M.A. from Harvard University. He also attended the U.S. Army Command and General Staff College, the Army War College, and the Capstone Course at the National Defense University. Commissioned in the Infantry, he commanded at all levels through assistant division command. His most recent publications, on subjects from tactics to strategy and military transformation, have appeared in Armed Forces Journal, Army Magazine, Military Review, Artillery Journal, Strategic Studies Institute Papers, and in AUSA Land Power Papers.

PHOTO: Statue in Cherbourg-Octeville, unveiled by Napoleon III in 1858. Napoleon I once remarked that in war “the moral is to the physical as three to one.” (Eric Pouhier, <http://creativecommons.org/licenses/by-sa/2.5/>)

For those who have been in the trenches, and working closely with the brigade combat teams most involved in the challenges of trying to “influence” the behaviors of real people under stress, these two tenets have proven amateurishly inadequate. While progress is being made on other fronts of “defense transformation,” IO is stuck in an outmoded and naïve mind-set. Pentagon bureaucracy labors under the tyranny of a sluggish, lowest-common-denominator, top-down-bias in Joint doctrine. Engrained and enshrined habits of thought stand in the way of learning, unlearning, and relearning.

I have been an advocate, practitioner, and observer of IO since its birth, and I have witnessed and experienced its evolution. I understand both the timeless aspects of principles of action and the influence of new technologies. And I have a sense of what may lie ahead.

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Approaching a Conceptual Shift

Given the complexity of modern operating environments, foundational questions about IO have become problematic. Expected questions like “How can we better achieve information superiority and enhanced information effects?”, “What are the ‘best practices’ in the field?”, and “What is the best way to integrate core IO capabilities?” reveal inherent flaws in understanding how IO fits in a comprehensive theory of war. Attempts to answer such questions reveal symptoms of error, anomalies in theory, and tensions in logic, rather than solutions. The very term “IO” loses all descriptive and explanatory power when trying to make normative judgments from current doctrine and past understanding. In other words, it would be impossible to fix IO by working within the confines of the current understanding of IO. Asking these same questions again would not provide a fresh assessment.

To gain the most value from IO capabilities, we need to examine what roots underlie the symptoms,

anomalies, and tensions evinced in the questions that current missions prompt:

- Has something enriched our understanding since the 1990s that could change current paradigms?
- Do current paradigms sufficiently describe and explain cause-and-effect relationships?
- Do current paradigms predict and control outcomes?
- Are current processes fundamentally relevant to current problems?

Answering these questions will entail examining paradigms for the following:

- Capabilities planning and collective employment.
- Actual purposes that capabilities serve in practice.
- Commanders’ specific needs.
- What exactly we really do when we use IO.

Addressing these concerns requires determining exactly what “IO” denotes to experts in the professional literature and precisely what it means to practitioners in the field. Such an examination should lead to alternative paradigms that more accurately meet current and future needs. It should reveal how staff and command processes need to change, and what capabilities need to change and why.

The study undertaken to answer these questions resulted in a lengthy report that is yet unpublished. This article contains broad conclusions from the study, and it recommends specific changes. Forthcoming articles will entail more detailed recommendations.

Broad Conclusions

Current IO paradigms suit the main problem framed in the 1990s: how to rapidly and decisively take down a modern, well-defended regime also dependent on modern information-age technologies. Although current “core, supporting, and related capabilities of IO” will likely be central to achieving success in foreseeable 21st-century military missions, those capabilities require scrutiny to understand the most effective way to integrate them. The current overarching IO paradigm misframes the problems facing both operators and commanders today. They thus gain less from these capabilities—and the competencies required—than they could. A major implication is that it is time to give up the practice of IO as a separate LLO within our greater military operations.

Current conditions require organizing for, and developing greater competence in, the ever novel and complex operations the information age presents.

New ways of thinking are required to achieve the full benefit of IO capabilities. Current ways do not provide a relevant logic for IO. For instance, it will be more important to integrate words and deeds than to integrate the employment of IO capabilities into one LLO. It will also be more important to tailor planning approaches to the nature of the tool, and the causal logic that governs its function, than to assume that tools based on a linear logic and those based on a non-linear logic can both use the same planning approaches.

Logic and experience suggest it will be more important to pursue *three* ever-present, but practical, mission needs than to pursue (the grander, doctrinal, but over-ambitious) task of achieving “information superiority” to “influence, disrupt, corrupt,” and so on. These needs are:

- Win the psychological contest with current and potential adversaries.
- Keep the trust and confidence of home and allied populations while gaining the confidence and support of the local one.
- Win the operational and strategic, cognitive and technical “information-age applications” contest with current or potential adversaries.

It will be necessary to integrate the capabilities for meeting these needs into a combined arms pursuit of multiple objectives (rather than, as aforementioned, pursuing one separate IO LLO).

Effective application already also requires expertise in very different disciplines. It will become even more important to reorganize IO capabilities into groupings for staff oversight that share common functional purposes, causal logic, and art- and science-based competencies. Leaving the collection of IO tools under the oversight of one staff officer has become an untenable option, and proper preparation and education will be increasingly difficult to achieve.

Once we re-think the way to employ the tools and competencies now in the IO kit bag, we need to educate, train, organize, and resource as if we were serious about their efficacy. The scope and scale of efforts to unify the message of words and deeds, and to win the cognitive and technical contest, need to be well organized and adequately resourced. They currently are not.

Environmental complexity has also forced the realization that current paradigms require radical restructuring rather than patchwork repair. The logic underlying these conclusions is summarized below.

Coherence of Words and Deeds

New paradigms have to account for necessary coherence between words and deeds. Many centuries ago, Sun Tzu emphasized the natural blending of the physical and moral domains in war. This wisdom was practiced by successful military commanders through the ages and later formally endorsed by both Napoleon Bonaparte and Carl von Clausewitz. Until recently, military theorists and practitioners agreed that an important defeat mechanism, not only in tactical engagements but in battles and campaigns as well, was to establish what was called “moral superiority.” This psychological effect (on morale) prior to action would ideally



Statue of Sun Tzu in Yurihama, Tottori, Japan. Sun Tzu's *The Art of War* remains the masterpiece of holistic war theory.

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assure a more complete and rapid success. Americans have bifurcated these domains to some degree in their reliance on technology (which carries no inherent moral content). Separating IO as a distinct LLO works against the naturally cross-reinforcing physical and psychological aspects of war.

At the same time, military culture evolved a bias toward “effects” in the physical dimension that was fostered by technologically evolved, simulated training environments. These gave little credit to non-physical, psychological battlefield influences. This growing bias fed the artificial bifurcation of the naturally conjoined physical and moral domains of war. The complex pathos of counterinsurgency has raised awareness of the moral domain again, but related distinctions are not well understood. For instance, so-called “kinetic” and “non-kinetic effects” and lethal and non-lethal actions present dissimilar logical categories. Non-kinetic effects can include electronic warfare and computer network operations that still operate in the physical domain. Lethal “effects” affect morale. Non-lethal ones may not. We need to return to the classical distinctions without losing our physical effectiveness.

Military actions may change physical facts, but they also change moral facts as perceptions, attitudes, and subsequent behaviors. Actions speak. They can demonstrate professional competence that engenders respect and fear, and everything we convey in words and images should resonate in harmony with our actions. Only when actions and communications resonate in harmony do words and images acquire a multiplier effect. Well thought-out actions remain the most convincing way to influence human behavior. Well-chosen, well-targeted words and images that build on such foundations can enhance that sphere of influence. Current doctrine, training approaches, and education should

change to reinforce the natural fusion of war’s physical and moral (psychological) domains. Our less bureaucratic adversaries already get it.

Highly Complex Missions

Modifying command and planning processes to focus on the very complex missions soldiers encounter today should become a priority. Useful application of some IO competencies must take the complexity of causal chains into account. The Army and the Marine Corps have been working on modifications to command processes for complex missions, and both the Army War College and the School of Advanced Military Studies have modified instruction to address them. But no one in authority has yet directed changes in doctrine and general practice based on the missions that prevail today. Doctrine still centers on missions with unambiguous and unitary objectives. Such missions involve distinct and hierarchical adversaries and allies within clear contextual boundaries. They present problems one can solve using a linear logic. Most missions from Grenada to Operation Iraqi Freedom (OIF) have required the pursuit of multiple parallel and sequential objectives involving shadowy and non-hierarchical adversaries. They have involved local informal alliances with varied partners within uncertain contextual boundaries that contain problems exhibiting complex, non-linear and interactive causal chains possessing no clear solution (e.g., the mission statement “Fix Ramadi”).

This complexity is not limited to stability operations or counterinsurgencies. Such qualities were as present in OIF I and Operation Enduring Freedom (OEF) I as they have been in later rotations. Complexity and novelty conspire to make lessons learned in one mission potentially non-transferable to the next, and this intractability makes stabilizing doctrine difficult. A combination of increasing complexity and novelty demands modification of the normal linear Military Decision Making Process (MDMP), effects-based planning (EBP), and the Joint planning process. Consensus is gathering that complex missions require as much command attention to “problem formulation” decisions as to “solution implementation” decisions. Formulation is less based on deductive analysis than on inductive synthesis—akin to a doctor’s diagnosis.

When the available doctrine cannot provide a logical template for coping with the complexity at hand, a commander must try to discover that logic in some disciplined and rigorous way. More importantly, complex missions also require turning inside the learning-adaptation cycle of other relevant actors in the mission context.

Extended operations naturally involve iterative cyclical processes of acting, sensing, deciding, and adapting. Even under the best circumstances, cognition in this interactive complexity drives operations to proceed on an imperfect understanding of inherent networks of causality. The commander's diagnosis must start with a hypothesis as a basis for initial action. Initial actions can then aim to improve the situation and enrich or clarify understanding. This approach is natural to all organic beings and societies. We only need to do this deliberately and more scientifically.

Information operations practitioners play a critical role in solving their command's ill-structured problems because it is their milieu. Their ill-structured challenges (composed of complex, non-linear, and interactive causal chains) involve deriving maximum value from IO capabilities. Linear planning processes that apply to fires and targeting involve predictable first-order effects in the physical domain. According to a well-understood linear logic, they create easily recognizable and measurable results. Such "normal" operations appropriately involve so-called "effects-based" planning. IO's psychological operations (PSYOP), military deception (MILDEC), public affairs (PA), and the like present difficulties that do not yield to an effects-based analysis. They operate purely in the moral domain according to a complex logic that has unpredictable second- and third-order ramifications. Predicting even their first-order effects is monumentally problematic, and that elusiveness may confound any attempt to sense and measure them.

Some IO missions, like operations security (OPSEC), information assurance (IA), counterintelligence (CI), and civil-military operations (CMO), operate across both the physical and moral domains. They produce predictable first-order effects according to the linear logic of physical laws, but their actual primary purpose is a product of second- and third-order effects attained by a far more complex logic. Easily recognizable and measurable first-

order effects of each of these can be achieved within the logic of effects-based planning. But the further effects that actually produce the broader primary purposes of such missions result from complex causal chains. Thus the ends of OPSEC, IA, CI, and CMO are properly pursued by the same effort of learning and adaptation as applies to capabilities that operate purely in the moral domain.

Seeking desired outcomes amidst such complexity requires a disciplined, sustained, and purposeful iterative cyclical process: acting, sensing, deciding, and adapting. There will always be an imperfect understanding of inherent causal networks in such missions. Actions (or events) are designed as much to learn as to advance desired ends, and the aim is to turn inside the learning-adaptation cycle of other relevant actors.

Many known and unknown actors and events beyond the command's control constantly influence this milieu. It competes with a multiplicity of agents in the mission context and needs to learn how to inform and influence despite this intricacy. Maintaining coherence of words and deeds becomes paramount because the command's communicators compete in a realm of moral credibility. When the command sends discordant messages through its actions, or it fails to cross-reinforce words and deeds, its credibility is shaken. Lack of harmony between words and actions confuses audiences, and lack of consistency in messages further erodes credibility. And messages that are too general, rather than confined to the purpose of the command's mission, inhibit coherence.

Sensing relevant feedback is necessary, especially about the consequent behaviors of all relevant actors. Feedback makes it possible to make sound decisions about how to modify messages, actions, methods, approaches, modes of sensing, objectives, and even the framing of the problem. Learning how to learn about things the command is not organized to learn about is both difficult and essential. We neglect to test and improve the effectiveness of our ability to sense, thus we fail to learn how to learn. Such shortcomings affect our ability to improve our understanding of causal (influence) networks at the core of complex missions. Thus we impede progress toward mission goals.

This "turning inside the learning-adaptation cycle" logic is fundamental to getting the most value from IO capabilities.

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Practical and Realistic Purposes

A theory's purpose has to be practical. To be useful, a theoretical paradigm's purpose has to be achievable via a science-based (empirical) logic. The purpose inherent in current IO paradigms is too abstract, thus unmeasurable, and far too ambitious, thus unrealistic.

Joint doctrine's stated IO purpose (noted above) is too narrowly focused on adversaries. It also assumes that IO capabilities are not only necessary but sufficient for success. As such, this formulation recalls RDO because it does not address moral complexity like gaining the trust, confidence, and support of local populations. It thus underestimates adversarial decision-making where many things beyond the knowledge or control of IO operators will have influence.

In Army doctrine, IO's purpose is "to gain and maintain information superiority, a condition that allows commanders to seize, retain, and exploit the initiative." In actual practice, this abstraction is rarely the practical objective of IO LLO. The doctrinal purpose is far too idealistic and ambitious for the causal logic it suggests. Such broad dogmas encourage fuzzy thinking among IO professionals by using pseudo-scientific terms such as "information effects" (meaning the output of any or all IO capabilities) and "influence operations" (implying that IO capabilities are the only means commanders have to influence human behavior).

The real aim of commanders and their IO practitioners is to contribute to three broad purposes essential to the success of all highly complex missions:

- Win the psychological contest with current and potential adversaries.
- Keep the trust and confidence of home and allied populations while gaining the confidence and support of the local one.
- Win the operational and strategic, cognitive and technical "information-age applications" contest with current or potential adversaries.

Each of these necessary, realistic, and tangible

aims relies on distinct, understandable logic and specific competencies. They accurately describe what savvy modern commanders actually do with IO by usefully categorizing by communities of common logic and purpose. They exhaust all uses of what is meant by "IO" in current professional usage. This ad hoc categorization facilitates the evolution of capabilities, competencies, and deeper expertise. While current formal IO categorization is a selective association of capabilities having to do with manipulation and processing of "information" (a common input to *all* military aims and functions), this approach categorizes more usefully by outputs. It focuses on intended results and the unique way they are achieved. This is a much more useful way to think about solving military operational problems in highly complex and dynamic mission environments.

Psychological war. In highly complex mission environments, winning the psychological contest is the main effort. Excellence in operations depends not only on using force to elicit change, but also on leveraging one's reputation for physical efficiency to influence decisions in the moral domain. Intimidating, demoralizing, mystifying, misleading, and surprising all aim to influence the physical domain. Such a holistic approach to real and potential adversaries uses psychological warfare, or "PSYWAR." PSYWAR was natural to Alexander, Hannibal, Caesar, Napoleon, and the other great captains up through the 20th century. A holistic approach continues to be essential to success. The less we can bring brute force to bear, the more we need to engage a psychological impact. The more our application of force becomes precise and discriminating, and the more rapidly our capabilities advance, the more artful we need to be in linking deeds, images, and words to leverage a psychological impact.

In practice today, deeds, images, and words are insufficiently linked due to segregated staff processes and doctrinal insistence on IO as a distinct LLO that often deploys empty threats and illusory rewards in pursuit of overly ambitious ends. Current Joint and Army IO doctrine tends to understate, and underrate, the difficulty of influencing desperate and creative people to do what they really don't want to do. We can never presume to understand the fears of others or what rewards will entice. Moreover, empty threats and illusory rewards are increasingly difficult to mask in an increasingly transparent world.



Alexander fighting Persian king Darius III. From the Alexander Mosaic, Pompeii, Naples National Archaeological Museum. Alexander psychologically conditioned his enemies before battle.

Because we can never be sure how opponents will react to words and images, concrete actions designed to force choices inevitably follow. Therefore the PSYWAR paradigm encompasses both the art of conveying threats and rewards (PSYOPS) and the art of combining with actions intended to force choices. Helping the adversary understand the inevitability of choice-forcing actions is the function of PSYOPS.

Creating and exploiting a line of least expectation to the enemy's greatest vulnerability is central to the most economical and decisive path to success. The art of deceiving an adversary (more specifically mystifying, misleading, and surprising), is more than electronic deception, the aspect most emphasized by Joint IO doctrine. In the modern transparent environment, creating synergy between words and deeds (by harmonizing them) is essential to making the intended impression. Coordinating words and deeds resonates operationally, and understanding human behavior in the face of such synergy is as important as any other action or factor.

Past great captains wove the psychological and the physical together in actions against adversaries. Alexander, for example, always prepared for physical engagements by a thorough reconnaissance and psychological conditioning of his adversary. Genghis Khan and Tamerlane were both adept at following-up operations with psychological exploi-

tation that extended implications to the furthest extent possible. Such intellectual rigor should become the habit of all American commanders at all levels.

Adopting a rigorously holistic approach to war will have profound implications for military education. Deep expertise in human psychology will be necessary. Army and Joint doctrine are not clear enough about the logic and theory that concerns the ever-present mental contest with implacable adversaries. While the moral dimension of war was well understood by Sun Tzu (writing in, roughly, 500 B.C.E.) and elaborated by military theorists since, we have lost touch with it. The modern literature of human psychology and decision-making is abundant, and this science is rapidly advancing. We only need to add information-age conditions to a holistically woven theory of war.

Military public relations. Keeping the trust and confidence of home and allied publics, while gaining the confidence and support of local populations, was crucial in the Peloponnesian War. Such considerations are classical, not new. The major difference today is the speed with which populations acquire information. Adversaries today can misinform, distort events, and prejudice relevant populations if they act quickly. Technology makes gaining public confidence and support far more immediate than ever before. It also used to be possible to think of affecting two separate populations—the home front and those in the battlespace. Such distinctions are no longer practical. “Military public relations” is the term that best describes the increasingly important and indivisible art of gaining and maintaining favorable relations with the public at home, in allied countries, and in the area of operations abroad.

Public opinion is the arbiter of success in all military operations. In this age, military public relations must increasingly become an integral part of operations. When people at home and in allied countries get the impression that their forces are ineffective and illegitimate, they will withdraw support. When people in the battlespace believe our enemy is winning, they will join them just to survive. When they believe our operations are illegitimate and against their interests, they will oppose us.

Before the first physical encounter with an indigent population occurs, a moral reconnaissance of the human terrain should precede. A focused military public relations effort must first identify and assess potential allies and condition first impressions. And as situations unfold, the aim of military public relations among the local population should relate a coherent and credible narrative of success, progress, and positive consequences. Given the latent violence of military forces, this problematic work is increasingly essential for success.

Realistically, military forces have to prove worthy of the great risks these local populations are being asked to accept. Because of this, lessons from commercial advertising are not necessarily as directly applicable as some practitioners in the field believe. Soldiers and Marines are not selling a product. Our approach to winning approbation from the home front populations is overly centralized, too slow, inflexible, and outmoded. It would benefit from a “mission command” approach to de-centralized control. However, winning local allies, and gaining trust and confidence, is grass roots, bottom-up work, not susceptible to economies of scale. Absolute unity of effort is required for success in military public relations because these two related but separate challenges are so entwined today. You cannot say one thing to the media for broadcast back home and another thing to the village elders in the area of operations. Actions communicate better than words in both cases, and neither audience wants to be propagandized and manipulated. Such “influencing” is the common jaded perception resulting from PSYOP. Behaving professionally, and telling it straight, simply, and quickly works best.

Both halves of military public relations must contend with people apt to switch between positive and negative attitudes based on changing perceptions. (Human beings have difficulty remaining neutral.) The object is to keep the trust and confidence of the people who bear the burden of operations. Whether that burden is indirectly financial and moral, as at home, or a direct physical and moral imposition on those in the conflict, the majority need to be real allies in the fight. Failure is certain if they are not. When any mission aims to depose one government and facilitate the establishment of a new one, a radical and much more challenging shift in indigenous attitudes becomes necessary.

Being first with the truth is paramount in achieving such a shift. Minutes and hours matter whether that truth is a notable mission success, a failed enemy initiative, or bad news. The need for alacrity has outdated traditional mechanisms of vertical message control, which must be replaced. In other words, just as “mission command” relies on commanders’ judgments to decide how to implement the intent of higher authorities, their discernment should likewise be trusted to filter and decide what should and could be said in public, as long as it pertains to their mission. Such trust streamlines clearance decisions, keeps spokespersons circumscribed, and is the only control mechanism that has a chance of meeting the speed required for success. It implies taking and maintaining the initiative to inform. It is the only way to guard the fragile credibility of any command on foreign soil.

The art of gaining and maintaining favorable relations with people in the area of operations also requires an interpersonal alliance with specific communities and their leaders. Such work depends on local social dynamics and cultural knowledge. We are neither organized nor educated for this work. Knowledgeable professionals should perform this work at brigade level and below where commanders have reorganized to perform it with available but undereducated people. Progress depends on accurate feedback of local perceptions, and specific knowledge about relationships, agendas, and interests. Our intelligence services are still primarily oriented toward learning about our adversaries and are ill-equipped for cultural expertise. Learning mechanisms in this dimension are stunted, and improvisation at this level has had mixed results.

Public law permits PSYOP organizations to conduct what I call military public relations, as long as it takes place abroad, even when it aims to influence allies in their homelands. Military leaders who are realists understand why this latitude is myopically problematic, even if “truth-based.” Realistically, PSYOP should only be directed at command-designated adversaries. Oversight of PSYOP agents at every level is increasingly necessary to avoid damaging the military public relations effort.

Ironically, without the PSYOP capabilities now available to them, commanders would be short-handed in their military public relations efforts. These efforts increasingly require more competence

at lower and lower levels of command. Applicable career fields need to adapt to new demands and to expand capabilities within a broader, more realistic military public relations paradigm. And military public relations professionals require deep expertise relevant to spanning these challenges that comprise this necessarily unified field of competence.

NETWAR. Winning the strategic, operational, cognitive, and technical “information age applications” contest is becoming increasingly essential. Decisions have in the past depended on the commander’s personal knowledge or on that immediately acquirable from those within voice contact. Since the first telegraph was set up in 1844, the electron has been harnessed to facilitate the transmission of critical information. We now live in a world of technology-enhanced networks of great variety and scope. Rapidly evolving technologies are increasing not only the speed of modern networks, but also their effectiveness, power, and adaptability. As aforementioned, the idea of being somehow able to dominate an “information domain” and achieve “information superiority” is now naïve. Instead, focusing on modern communications, information processing, automation, and other rapidly evolving network applications and how to advantage our own operations and disadvantage the various kinds of adversaries we may face is more realistic. But such efforts require deep expertise centered on the science of electro-physics, cyber-electronics, and complex cyber network behaviors. They also require knowledge of how these relate to military tactics, operations, and strategy—such expertise is now much too scarce. The art has yet to acquire a military name, although some use the term “information operations” in this stricter understanding of electro-physics- and cyber-electronics-centered sensemaking. To avoid confusion I will use the term “network warfare” or the abbreviation “NETWAR.” Related to NETWAR are:

- Use of modern automation enhanced networks to make better decisions than the enemy in less time.
- Deployment of technology to construct “super-efficient” proactive and reactive strike networks better than the enemy can. In theory, and as information technologies advance, reactive strike networks will become the backbone of defenses. Such networks operate on the principle of achieving the greatest possible efficiency when the enemy

has the initiative. The proactive kind operates on the principle of achieving the greatest possible effectiveness when one has the initiative.

- Denying this same potential to adversaries by destroying, disrupting, corrupting, and usurping the enemy’s networks and the information gathered and processed within them. Such efforts must be holistically and closely coordinated with intelligence functions that depend on clandestinely harvesting valuable information from such networks.

- Assuring the speed, efficiency, and integrity of our own networks and information processing capabilities. An area that requires a holistic approach as well, it requires broadly assigned but specific responsibilities with increased leader awareness and education. New paradigms must also take a realistic and comprehensive approach to contesting our adversaries in the dark corners of the Internet. Old notions of controlling or dominating a “domain” are absolutely unrealistic.

- Denying terrorists and extremists the unfettered ability to post their websites, recruit new members, spread propaganda, and plan attacks across the world. The speed, ubiquity, and potential anonymity of Internet media make ideal communication channels for militant groups and terrorist organizations.

- Denying adversaries the ability to attack our Internet-accessible financial, transportation, power generation, and other information infrastructures. Army forces should play a part in defenses of our strategic infrastructures and in counteroffensives against adversaries who attack them.

NETWAR is a natural growth area, and clear thinking must precede a disciplined and scientifically layered approach to this paradigm’s evolution.

Three powerful advantages. Current IO doctrine abstractly describes cause-and-effect relationships assuming a linear causal chain in the absence of historical experience and scientific proof.

The three broad purposes (psychological war, military public relations, and NETWAR) in the new paradigm above are inherent in every mission. Ample historical evidence, established military theory, and scientific study back this fact. Its conceptual formulation has three powerful advantages:

- It results in easily identifiable, tangible, and measurable mission tasks.
- It highlights the necessity but insufficiency of IO core, supporting, and related capabilities and

thus addresses the issue of essential synergies with capabilities outside the IO realm.

- It provides a more realistic path to deep expertise, more pertinent and clearly focused.

In the context of a specific mission, these purposes easily translate into tangible and measurable mission tasks.

However, while IO core, supporting, and related activities are normally necessary to achieve these broad purposes, they alone would rarely be sufficient. Sufficiency will result from a combined and coherent application of these purposes with capabilities outside the IO rubric. For instance, as powerful as words and images can be in the modern world, actions still speak louder. And as much as NETWAR contests will center on information technologies, sometimes sufficiency will depend on combined action with other capabilities outside that field.

Getting the most value from all IO core capabilities requires a far greater depth of expertise than is achievable by IO generalists within current IO paradigms. Even within the confines of pre-9/11 operational concepts such as RDO (for which IO was conceived to be an enabling tool), the required span of knowledge was challenging for any one person to acquire. Now, deep expertise is needed within these three communities (psychological war, military public relations, and NETWAR) of common logic and purpose, each of which applies a distinct area of competence.

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Integration, Staff Oversight, and Necessary Organizational Changes

These essential IO capabilities and competencies require proper integration, the right staff oversight to optimize their value, a more useful approach to planning, and some adjustments in scope, scale, and focus.

Rationales for integration. Highly complex missions require the pursuit of multiple parallel and sequential objectives. Each objective requires

influencing a different set of actors in ways relevant to the mission. Each resulting LLO will address problems exhibiting complex, non-linear, and interactive causal chains. The task force assigned the objective will integrate the appropriate arms and capabilities necessary and sufficient for success. Thus, rather than merely the integrated employment of IO core, supporting, and related capabilities in one LLO, the output must be integrated fully into the multiple lines of operations of the command.

Logic for staff oversight. What rationale should guide the oversight of this collection of capabilities? In one sense, elements of this collection naturally fit under staff sections that already integrate like-functions. Electronic warfare and computer network attack are weapons systems because these tools can be aimed at targets, just like artillery and attack aircraft, and they can temporarily suppress the functioning of equipment, networks, and command posts. This means they belong under the commander's agent for planning and coordinating the employment and effects of such weapons. Some aspects of operations security should return to G-3 oversight, but network security properly belongs to G-6 oversight. PA and PSYOP need to be coordinated within the staff on two axes.

The first axis is between the proper realm of PSYOP and the proper realm of Public Affairs. The logic presented in this report would further restrict the focus of PSYOP only to groups designated by the command as rivals, opponents, or the enemy. This distinction is no longer apparent, and as a command decision in every case, there has been counterproductive misapplication. Clearly it should not be a decision left to tradition or to the broad outlines of the law. The doctrinal mission of PSYOP must be to amplify for real and potential adversaries the implied messages of the unit's mission and actions. Meanwhile the mission focus of military public relations must be to speak for the command to all foreign and domestic audiences (because whatever is said to any audience has to be suitable for all). No open communications should disadvantage the campaigns of military public relations. And therefore PSYOP messages to the enemy must travel by means least likely to reach or influence non-enemy designated publics.

The other axis requiring close coordination is the one between words and deeds mentioned earlier. Neither the psychological contest with adversaries, nor the important effort to keep friends and gain allies,

will succeed unless the physical and moral domain efforts are unified. The current cleavage between these two can be overcome only when education and training reinforces the unity of the moral and physical domains. The command's planning staff should include officers with deeper expertise in the arts of both PSYWAR and military public relations than the normal command and staff course graduate has.

A start has been made in that direction, because the School of Advanced Military Studies (SAMS), the primary source of division and corps planners, has been directed to educate its students in the art of military deception, and the MILDEC staff responsibility is assigned to the G-3 (plans and operations). SAMS graduates need deeper expertise not only in MILDEC but also in the broader arts of PSYWAR and military public relations. The G-3 should be responsible for insuring that the actions of the command speak clearly toward the objectives of every LLO and toward the mission as a whole. The G-7 (public and command information) should be responsible for advising the G-3 and commander about the impact of actions on perceptions, and for amplifying and clarifying the intended messages of the command's actions in support of all of its LLOs.

The G-2 (intelligence) should support the G-7's work as much as the G-3's. Most reviews of IO have ignored the weakness in the G-2's ability to provide sensings useful to the G-7's work. The bulk of the G-2's capability is oriented toward discovering relevant physical facts. The G-7 gets very little G-2 support toward discovering relevant perceptions. This is a legacy of the Cold War that needs to be remedied.

Of the IO supporting capabilities, information assurance and combat camera now belong to the G-6 (information management and communications), physical security and physical attack belong to the G-3, and counterintelligence belongs to the G-2. Only combat camera needs a new source of staff oversight. By doctrine their historic mission has been to document on film the operations of the Army. The G-3 is responsible for assigning them to units for that purpose. In recent practice, enterprising IO and PSYOP officers have enlisted their help toward documenting the unit's version of events. The Army needs to officially assign these to the oversight of the G-7.

All three of the IO related activities (public affairs, defense support to public diplomacy, and civil-military operations) properly belong under G-7

oversight. Under the current staff arrangement there is no guarantee that the logic for deciding CMO projects reflects the aims of the "inform and influence" campaign unless the commander himself makes CMO project decisions. Civil-affairs units are also potent "inform and influence" agents because they must meet with local public officials in their work.

A more useful approach to planning. Planning for success in highly complex missions is different than planning for missions with unambiguous and unitary objectives, problems that can be solved using a linear logic. The ambiguous complex mission requires the commander to construct a theory of what something like "Fix Ramadi" might mean. A theory of cause and effect that leads him to that end is then necessary. This theory will inevitably be constructed along the following lines: "If I can get group A to behave in this way, and group B another specific way, and group C still another way..." and so on.

The important points are that each line of operations has to do with influencing group behavior (to change it) and that only when those behaviors change can progressive objectives be attained. A further point is that the path from the current to the future involves non-linear and interactive causal chains, shadowy and non-hierarchical adversaries, and local informal alliances with various kinds of partners within unclear contextual boundaries.

To change human behaviors under these conditions, words, images, and actions have to be very much in sync. That is, a separate IO line of operations, or an overall "effects" process, is less likely to work well. All relevant tools required to advance along each line of operations have to be integrated to maximize synergy. Finally, every such LLO has to be treated as a campaign within the larger campaign in the sense that desired outcomes require turning inside the learning-adaptation cycle of other relevant actors. This requirement means the command and staff processes of the headquarters have to be disciplined, sustained, and purposeful as an iterative cycle of acting, sensing, deciding, and adapting along multiple LLOs. There will always be an imperfect understanding of the inherent causal and influence networks, and actions or events will be designed as much to learn as to advance desired ends. Such deliberate adaptation is not the norm today.

Rationales for organizational adjustments. In future complex missions, the effects of relevant facts and perceptions are equally important. Staffs

and organizations essential to both realms should be equally well organized and manned. PSYOP, CMO, and PA organizations and G-7 staffs need adjustments. Until we do this, we are not serious about IO transformation.

The G-7 should be commensurately manned well enough to participate in normal principal staff planning and coordination. Also, future missions will require a baseline PSYOP, CMO, and PA capability in the conventional force down to brigade combat team and organic to the conventional side of the Army. Staffs sense, plan, coordinate, and supervise, but they are not executors.

Active PSYOP units are scarce and tend to deploy under the supervision of special operations units within Joint task forces. This situation will more than likely also be the normal practice in the future. Active PSYOP units should specialize to serve the special operations forces community exclusively and more expertly. Currently, the conventional force tends to be augmented with reserve component PSYOP units. These units cycle in and out of active operations at a different rhythm than the units they support. It would be better if they could synchronize with the supported unit's force generation life-cycle. What these units do for the conventional force is now vital because they fill a void. In some cases their work supports combat operations against the enemy by providing loudspeaker or leaflet support. But PSYOP units are more often used to inform and gain support of local communities. For the reasons already stated, this use of PSYOP detachments is dysfunctional as it can backfire when revealed.

What the conventional force really needs is an organic, sufficient military public relations capability down to the lowest level. This can be in the form of inexpensive equipment in the hands of troops with some baseline knowledge acquired in the education system and reinforced in training. Inexpensive loudspeaker systems for use by assigned interpreters, or with prerecorded messages in the local language, can be very useful, as would inexpensive multi-purpose digital cameras to record events. This dual-purpose equipment can be used in both the psychological contest with adversaries and also in the effort to inform and engage local populations. How to use them effectively is now a combat skill on an equal plane with a call for fire, and thus needs to be taught to NCOs and junior officers.

The conventional force also needs an organic baseline of military public relations detachments. Every brigade combat team commander requires a small specialized detachment to engage the ever-present media, to reinforce the local "inform and engage" effort where needed, to cultivate specific communities, and to arrange and organize the public relations events of the command. It would be far better that these be PA detachments working under the supervision of the command's public affairs officer, rather than reserve component PSYOP detachments under the supervision of the command's PSYOP officer.

Revision of Manuals

A paradigm shift, as Defense transformation intends, is required, and it can occur in two steps. The revision of Field Manual 3-13, *Information Operations*, could be the first step by explaining why IO core, supporting, and related capabilities have become more important, and by explaining the logic for getting the most value from them. It should address the logic of making progress when confronted with highly complex missions and tasks. It should also address the specific logics of PSYWAR, military public relations, and NETWAR. The final chapter should address staff organization and battle command issues.

The next step should be a revision of Joint Pub 3-13, *Information Operations*. Consideration should be given to producing two manuals. One could be called "Inform and Engage," the function the Army has assigned to the G-7 as modified here. The other manual would be a more developed version of what I have labeled NETWAR—the art of achieving, maintaining, and employing advantages over our adversaries in the application of modern communications, information processing, automation, and other rapidly evolving network applications. The one focuses on the modern twist to an ancient art in the moral domain, the other on a new and rapidly evolving art within the physical domain.

Whatever we do, we need to bear in mind what doctrines are and what they need to do. Doctrines are a profession's theories about how to perform its mission. When these theories become a shared second nature, they are called paradigms. In any scientific field, theory begins as hypothesis, and sound theory is a tested hypothesis. Sound theory is also

built one level at a time. No military doctrine can be as theoretically sound as the established theories of the physical sciences, but they ought to be built from the bottom up in a similarly logical way. Valid and useful doctrinal paradigms must, at minimum, be able to describe and explain observed phenomena, and must provide some basis for forecasting outcomes. This basis may be no more than accumulated experiential evidence (inductive logic). Some doctrinal paradigms, especially those closely related to the physical sciences, can reliably predict outcomes, and a rare few in the physical realm can even control the phenomena in question through a deliberate manipulation of its parameters.

Level of Theory	Corresponding Requirements of Theory
Describe	Concept Exhaustiveness
	Concept Mutual Exclusiveness
	Descriptive Scheme Supports Explanation
Explain	Description of System Causality
	Description of System Conditions
	Description of External Conditions
Predict	Forecast of External Conditions
	Forecast of System Conditions
	Forecast of System Based on Conditions
Control	Capability to Change System Conditions
	Capability to Change External Conditions
	Capability to Change System Laws

The schema above is a useful model for reflecting on the utility and reliability of our doctrinal paradigms. It also provides a basis for understanding the requirements of sequential layers. The first layer of a theory or paradigm is descriptive. Descriptions should be thorough (comprehensive), differentiate the described task from any other, and promote its explanation. The second, explanatory layer lays out the logic of systemic cause and effect and the impact of relevant internal and external conditions. The third level of theory development enables predictions of change in outcome depending on a changed input to the system, a different internal condition

prevailing, or a new external factor impinging on the system. The fourth, control layer of theory forecasts changes in outcome based on changed parameters of the system, changed internal conditions impinging on the system, or changed system laws.

Current IO paradigms do not score well against this standard. They are “descriptive” only in the sense that IO has to do with information. What real phenomena do they explain, predict, or control? The doctrines of their sub-component parts fare far better, but beyond assertions, there appears to be no real common thread of theory to explain, predict, or control phenomena via integrated application of core capabilities.

This standard is a tough one, especially because this doctrine must address complex phenomena. For instance, describing how to target an enemy position is more easily done than describing how to defeat a well-dug-in enemy, and that is simpler than describing how to discourage the planting of bombs. But describing how to persuade a particular group within a local population to support your military mission is much more difficult. Such complexity increases with the numbers of links and nodes required in a system for accomplishing relevant tasks, but the causal relationships also become interactive rather than simply linear. More variations of internal and external conditions are possible. Explanation becomes commensurately more difficult than description, and prediction commensurately more difficult than explanation. But doctrine need not be perfect, it only needs to be useful, and it will be useful only if it is built one sound layer at a time, first to describe, then to explain and so on.

Doctrine also ought to be to provide a reliable basis for learning and adaptation. There are certain historical inevitabilities. No plan survives first contact with the real enemy, and no paradigm survives substantial progress and change. Even for ideas, an inexorable evolutionary change occurs. Fitness is a function of evolutionary adaptation. So it will be for IO and the “IO community.” The current paradigm is not theoretically sound, and “IO” and its context need a foundational re-think. **MR**