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Microsoft, Al-Jazeera, and the Predator

The Challenge of Effects-Based Operations in the Global War on Terrorism

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Foreword

Welcome to another in our series called “The Wright Flyer Papers.” The Air Command and Staff College (ACSC) is pleased to publish our best student research projects each academic year. Our research program is designed to encourage our students to explore topics and issues aimed at advancing the application of air and space power and understanding the profession of arms. To that end, this series reflects our desire to perpetuate the intellectual spirit of early military aviation pioneers who availed themselves of time, here at Maxwell, to reflect solid research, innovative thought, and lucid preparation. Put another way, we think they are worth your time to read.

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RANDAL D. FULLHART
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Abstract

A complex and interdependent environment in the global war on terrorism (GWOT) highlights the challenge of translating the theory of effects-based operations (EBO) into practice, particularly with respect to influencing the will of the people and achieving a desired end state. The following paper seeks to illustrate the conditions and challenges surrounding the translation of current effects-based theory into operational practice in the GWOT by using three conceptual constructs. First, the Microsoft Corporation, its connectivity to the Internet, and the persistent attacks by computer hackers on Microsoft products help frame the adversary and the complex environment and conditions surrounding the GWOT. Second, the Al-Jazeera satellite news network serves as an anecdotal backdrop for the challenges military planners face in managing EBO assessment and controlling the “effects” in EBO. Third, the versatility of both the MQ-1B Predator unmanned aerial vehicle and Special Operations Forces illustrates the importance of developing and maintaining collective knowledge, technological relevance, and doctrinal adaptability in an ever-changing GWOT environment. Military planners who follow an effects-based strategy should recognize EBO’s inherent limitations and plan for its characteristic uncertainty and uncontrollability. In the end, the ability to manage the constructive and destructive strategic effects required to achieve a desired end state as complex as that found in the GWOT requires a holistic perspective that is, at its heart, more art than science.

Introduction

We also know there are known unknowns; that is to say we know there are some things we do not know. But there are also unknown unknowns—the ones we don't know we don't know.

—Secretary of Defense Donald Rumsfeld 2002

If there is a lesson we can learn as practitioners of air-power from the global war on terrorism (GWOT), perhaps it is that the complex and interdependent nature of globalization and technology have irrevocably and inextricably linked the world together in such a way that strategists must use diplomatic, informational, military, and economic instruments of power in unison to achieve success in future conflicts. Based on the abundance of well-documented post-9/11 thought and analysis, this observation is neither new nor profound and has become painfully obvious to even the most casual observer. However, a complex and interdependent environment in the GWOT highlights the challenge of translating the theory of effects-based operations (EBO) into practice, particularly with respect to influencing the will of the people and achieving a desired end state.

This paper seeks to illustrate the conditions and challenges surrounding the translation of current effects-based theory into operational practice in the GWOT by using three conceptual constructs. First, the Microsoft Corporation, its connectivity to the Internet, and persistent attacks by computer hackers on Microsoft products help frame the adversary and the complex environment and conditions surrounding the GWOT. Second, the Al-Jazeera satellite news network serves as an anecdotal backdrop for the challenges military planners face in managing EBO assessment and controlling the “effects” in EBO. Third, the versatility of both the MQ-1B Predator unmanned aerial vehicle and Special Operations Forces (SOF) illustrates the importance of developing and maintaining collective knowledge, technological relevance, and doctrinal adaptability in an ever-changing GWOT environment.

This paper does not dispute the anecdotal tactical and operational success of effects-based practices, particularly with respect to fighting a force-on-force conventional war.

History is replete with examples of successful EBO at work. Nor does this paper dispute the importance of tying strategic objectives to tactical tasks during the planning stage. Military planners must consider an effects-based methodology in joint deliberate and crisis action planning to produce a blueprint for combat operations. However, military planners who follow an effects-based strategy should recognize its inherent limitations and plan for its characteristic uncertainty and uncontrollability. In the end, the ability to manage the constructive and destructive strategic effects required to achieve a desired end state as complex as that found in the GWOT requires a holistic perspective that is, at its heart, more art than science.

Effects-Based Operations Defined

“A rose by any other name would smell as sweet,” wrote Shakespeare. Perhaps it is not without coincidence then that the fundamental principles of EBO theory are noticeably reminiscent of the foundational theories authored by the likes of Sun Tzu, Clausewitz, and the Air Corps Tactical School. Of course, many other theories have an obvious EBO flavor to them, including the five strategic rings theory espoused by Col John Warden and the control warfare theory developed by Observe-Orient-Decide-Act (OODA) loop founder Col John Boyd.¹

Joint War Fighting Center Doctrine Pamphlet 7, *Effects-Based Operations* (JWFC Doctrine Pam 7), November 2004, defines EBO as “Operations that are planned, executed, assessed, and adapted based on a holistic understanding of the operational environment, in order to influence or change system behavior or capabilities using the integrated application of selected instruments of power to achieve directed results.” The relevance of this definition in the GWOT lies not only in how well it addresses the complex nature of the EBO environment, but also in how well it stresses the importance of using the appropriate instruments of power to achieve a desired end state. A key component of this revised definition for EBO is the US Joint Forces Command’s (USJFCOM) political, military, economic, social, infrastructure, information (PMESII) construct. The PMESII construct illustrates the relationships that exist among its elements within the operational environment. A “collaborative information environment” is

the mechanism that facilitates this “multi-dimensional situational understanding” within the operational battlespace.²

Airpower has always sought to influence and affect the condition of the battlespace throughout modern history. One only has to consider the atomic bomb at Hiroshima or the Herculean sustainment effort during the Berlin airlift, or most recently, the prolific use of precision-guided munitions during Operations Enduring Freedom and Iraqi Freedom, to realize that “Airmen have always aspired to conduct effects-based operations.”³ If this is indeed true, then the recent drive to operationalize and refine EBO thought may be more a result of improved intelligence, strike, and assessment capability, rather than a wholly new interpretation of EBO theory. Also, a better understanding of the operational environment and its interconnected nature has likely contributed to the resurgence and repackaging of EBO theory.⁴ The fundamentals of systems theory and the principle of cause and effect help explain this relationship.

Key Principles—A Systems Approach and the Principle of Cause and Effect

From a theoretical perspective, two interconnected elements—systems theory and the principle of cause and effect—anchor EBO thought. Systems theory focuses on the ability to see the “wholes” within an environment—a “discipline” by which one can analyze and appreciate the relationships between related elements and processes.⁵ Ostensibly, the principle of cause and effect originates from the theories of Sir Isaac Newton and his third law of motion, which in its most elementary form states, “For every action there is an equal and opposite reaction.” The combination of these two principles forms the foundation of basic EBO thought. The reactions and interrelationships that exist within a complex system of interconnected nodes become the means and the “targets” by which EBO achieves a desired effect.

Much of today’s current organizational thought in the business world centers on the systems approach to management. Influenced by Peter Senge’s book, *The Fifth Discipline*, many business leaders have embraced a holistic systems perspective to remain competitive in today’s global environment. The necessity for “seeing interrelationships rather than things, for

seeing patterns of change rather than static snapshots,” is a competitive imperative in the interconnected world in which we live.⁶ As with the repackaging of EBO thought, systems thinking is neither new to business nor to military operations. In fact, it is a well-espoused theory found in a large number of dissimilar fields.⁷ In military operations, however, the sheer volume of information that promulgates today’s battlespace magnifies the importance of its consideration. As Senge writes, “Perhaps for the first time in history, humankind has the capacity to create far more information than anyone can absorb, to foster far greater interdependency than anyone can manage, and to accelerate change far faster than anyone’s ability to keep pace.”⁸

But how one influences and controls a system through the principle of cause and effect has also become more complex in today’s environment. Fortunately, the refinement of EBO thought over the years has resulted in a much better operational framework for cause-and-effect theory. Target-effect pairings, criticality versus vulnerability, and tight and loose coupling help subjectively characterize the cause-and-effect relationship within EBO theory.⁹ Target-effect pairings identify the basic relationships between nodes and desired effects. Criticality versus vulnerability helps determine the value of targets and the susceptibility of those targets to attack. Tight and loose coupling reflects the spring-like tension between targets and desired effects and describes the relative strength of the relationships between nodes.

The ability to impact singular or multiple nodes, either in sequence or in parallel, has increased the complexity of options available to operators.¹⁰ Information operations, precision-guided munitions, and specialized weapons now provide decision makers and strategists with a wide range of kinetic and nonkinetic choices to achieve a desired effect. The specificity of today’s weaponry, the dynamic combat environment, and the expectation of low collateral damage have contributed to the reason why the subjective facets of systems theory and cause-and-effect analysis must be considered in EBO.

Skipping Stones, Swords, and Plowshares

Systems theory and cause-and-effect analysis also help explain the fluidity of effects as they migrate across a system

of systems. The migration of these effects, internally and externally to a system, becomes a matter of importance to military strategists when considering higher-order effects and the possible strategic implications of tactical actions. If airpower practitioners and strategists skip stones in a pond, they must account for both the initial splash and the resulting ripple created by “destructive” or “constructive” actions. Whether the action is the devastating effect of a destructive kinetic weapon or the life-saving effort of constructive humanitarian relief, the ripples formed by skipping stones in a system are difficult to control and assess—a task made more challenging by the conditions of an interconnected environment.

The proverbial sword and plowshare characterize the destructive and constructive facets of EBO.¹¹ In his “EBO Universe” Mindmap presentation, USAF colonel Anthony Cain categorizes distinct air “actions” available to strategists as either destructive or constructive in nature.¹² Using a systems approach, Cain then links these actions to various operational and functional mechanisms that are the means to impact specific system elements.¹³ It is a useful methodology that helps associate and connect an initial kinetic or nonkinetic action to a resulting capabilities- or will-based effect. The relationship between destructive and constructive effects also highlights how effects can possess a reactive or preventive nature. In the GWOT and other asymmetric environments, the plowshare’s constructive and preventive nature is arguably the better means by which to achieve a desired end state. However, regardless of whether one chooses to use destructive or constructive EBO methods, strategists and practitioners must first fully understand and appreciate the system environment before firing any “effect.” The Microsoft Corporation and the technological connectivity of the Internet help illustrate this system environment in the GWOT.

Microsoft—Defining the Environment and the System

From their humble beginnings designing and developing Microsoft-disk operating systems (MS-DOS) for IBM’s first personal computer (PC), Bill Gates and Paul Allen have built the Microsoft Corporation into an iconic titan with a virtual monopoly on personal computing-based operating software.¹⁴

Arguably the greatest corporate symbol of the information age, the Microsoft Corporation and its user-friendly software, plug-and-play convenience, and dominant market share, have made it one of the largest and most successful corporations in the world. Yet, with its juggernaut-like resources and capability, Microsoft finds its products and operating systems constantly under attack by computer hackers and spammers who employ innovative tactics¹⁵ to bypass security and gain entry into personal computers and system networks.¹⁶ Microsoft, its intimate connection with the Internet, and its struggle against an adaptive and virtually invisible enemy provides an excellent framework to describe the challenges facing the United States in its struggle against the GWOT. EBO practitioners must fully understand the attributes of the interconnected adversary and his operating framework to have any hope of success in the fight against terrorism.

The Interconnected and Reacting Enemy

In many ways, the computer hackers and spammers who attack Microsoft and its products exhibit many of the same characteristics as the insurgents and terrorists who have attacked US forces and interests over the past several years. The speed and innovation of computer hackers in developing viruses and phishing programs to attack Microsoft systems mirror the audacity and slyness of Iraqi insurgents who heat up asphalt roads and bury improvised explosive devices (IED) to kill coalition forces.¹⁷

As students of the information age, these hackers and terrorists are well connected by an intricate web of cellular, satellite, and Internet technology. Virulent e-mail worms crash networks around the world on a seemingly routine basis, while videos posted on terrorist and insurgent Web sites show the beheadings of recently abducted hostages. Microsoft engineers and US strategists face a daunting challenge to keep pace with these thinking, reacting adversaries who adapt their tactics and techniques to evade new virus-protection software and to avoid detection by military intelligence sensors.¹⁸ The technological connectivity of these adversarial computer hackers and terrorists enable them to conduct operations freely and from virtually any “jungle” in the world.

The Urban Jungle and the Chameleon Effect

Guns N' Roses' hit "Welcome to the Jungle" has always been a crowd favorite with the military. It is an appropriate title for a song that strikes a reverberating chord with US forces actively engaged in the GWOT. Although the rugged mountains of Afghanistan remain one of the primary combat fronts for the GWOT, the urban centers of Iraq and the jungles of Southeast Asia and South America have become a refuge and sanctuary for various terrorist groups. Collateral damage and civilian casualty concerns in the concrete jungles of Iraq hinder the freedom of action and devastating effect usually enjoyed by airpower. Similarly, the jungle canopies and mountain topography of Afghanistan, Southeast Asia, and South America create a difficult environment for military forces to conduct their technologically savvy operations.¹⁹

The technological connectivity of computer hackers and terrorists help camouflage their movements within these urban and natural jungles of the world. They become chameleons moving through the indigenous crowds with relative ease, traveling freely along the virtual highways of the Internet or the dusty streets of downtown Baghdad. Their ability to blend into their surroundings is perhaps their greatest defense against a numerically superior and better-equipped military force. As Mao Tse-tung wrote, "Guerrillas are masters of the arts of simulation and dissimulation; they create pretenses and simultaneously disguise or conceal their true semblance. Their tactical concepts, dynamic and flexible, are not cut to any particular pattern."²⁰

Amorphous Centers of Gravity

The interconnected adversary, the urban jungles, and the chameleon effect all contribute to the challenging task of finding and targeting specific centers of gravity (COG). Microsoft and US strategists must cope with adversaries whose amorphous COGs have little shape or identifiable form, yet function in a way that causes acute problems in the security arena. Globalization and the system-of-systems effect exacerbate the ability to predict when, where, or how terrorists or computer hackers will strike. One only has to look at the Bali nightclub bombing in 2002 or the terrorist train bombings in

Madrid (just prior to the national Spanish elections in 2004) to recognize the scope of the problem.

The challenge for EBO practitioners is to determine how to achieve a desired effect against these amorphous COGs. “There does not appear to be either a national or even a regional leadership structure or organization that would lend itself to some nodal analysis or other center-of-gravity type process and there is no single-enemy structure that might be susceptible to interdiction,” wrote Col Robyn Read, USAF.²¹ In truth, the solution for achieving a desired end state in the GWOT may lie more in the ability of US forces to change the conditions of the environment rather than in their ability to identify these amorphous COGs. As the 2003 National Strategy for Combating Terrorism stated, “At the base, underlying conditions such as poverty, corruption, religious conflict, and ethnic strife create opportunities for terrorists to exploit.”²²

Recognizing the Threat

The challenge of this operating environment has not been lost on senior leaders and decision makers. The 2004 National Military Strategy (NMS), released in March 2005, addresses the seriousness of the GWOT security environment, describing it as “a more complex and distributed battlespace.” The NMS states that our military “will conduct operations in widely diverse locations—from densely populated urban areas located in the littoral regions to remote, inhospitable austere locations. Military operations in this complex environment may be dramatically different than the high intensity combat missions for which US forces routinely train.”²³

Of course, Microsoft also recognizes the threat to their products. During congressional testimony in early 2005, Microsoft senior executive Ira Rubinstein said, “The explosion in the volume of spyware, and the accompanying increase in the complexity with which those programs operate and the damage that they do, has had an enormous impact on Microsoft.”²⁴ His testimony reinforced an earlier written statement from Microsoft’s director of Windows Privacy who said, “They use ambiguity, coercion, deceit, and outright trickery to lure or even force users to execute or install unwanted and often invasive programs.”²⁵

Bill Gates outlined Microsoft's strategy to combat the growing security threat during the 2005 RSA Conference in San Francisco. In his speech, "Raising the Security Bar," Gates proposed a four-pronged strategy including advancing security technology, providing guidance to customers, investing in training, and enforcing legislation.²⁶ Of particular note, Gates highlighted the creation of a "malicious attacker" tester to identify levels of vulnerability. He also noted the existence of Microsoft's Security Response Center, a 24-hours-a-day monitoring system to ensure robust monitoring and information sharing and a "very, very rapid" response. Finally, Gates spoke of the need to train non-Microsoft software developers on how to write security code within their applications, as 75 percent of Microsoft's security problems originate from external applications.²⁷

In what could pass as a speech for the current GWOT, Bill Gates concluded, "It's a challenging area, and new threats seem to emerge all the time, but I'm optimistic that through these different efforts, what we're doing on our own, working with partners, working with customers, that we will be able to mitigate the security problems, and therefore, let the advances of this digital infrastructure really allow for fantastic things to happen."²⁸ Unfortunately in the GWOT environment, external influences such as the Al-Jazeera satellite news network creates additional challenges for practitioners of EBO.

Al-Jazeera—Managing the "E" in EBO

In 1996 the Arabic news network Al-Jazeera was born from the ashes of the BBC's Arabic television network.²⁹ Initially funded and subsidized by Qatar's emir, Sheikh Hamad bin Khalifa Al-Thani, Al-Jazeera has risen to become the "premier news network of the Middle East" with an audience of 65 million viewers. Although seen as controversial to many US viewers, Al-Jazeera through its extensive access to Arab audiences has landed interviews with several high-ranking US officials, including Colin Powell, Donald Rumsfeld, and Condoleeza Rice.³⁰

So what can military theorists and planners learn about effects-based operations from Arabic stations such as Al-Jazeera? First, these Arabic news networks remind us just

how difficult it is to shape and to influence a complex and interdependent environment such as that found in the GWOT. What appears to be an effective tactic or operation may have secondary effects or unintended consequences that are dramatically different than what we desired or expected. Second, the temporal quality or cascading effect of the skipping stone's ripple creates a time lag that directly impacts the pace of operations. Technology can speed the effect of the ripple, but certain effects may require greater patience in the assessment process. Third, EBO practitioners must frame the adversary and the noncombatant population from an appropriate operational perspective. This perspective is probably best seen through the lens of Al-Jazeera rather than that of the United States' Cable News Network (CNN).

First-, Second-, Third-, and Nth-Order Effects

Most people have probably heard of the “butterfly effect”—the analogy generally used to explain chaos theory. Massachusetts Institute of Technology meteorologist Edward Lorenz originally coined the phrase in 1972 during a presentation to the New York Academy of Sciences titled “Does the Flap of a Butterfly’s Wings in Brazil Set off a Tornado in Texas?” Although the discussion of chaos theory could incite a paralyzing debate on EBO, simply put, the butterfly effect describes how similar and seemingly small inputs into the same system can create vastly different results.³¹ Al-Jazeera and other Arabic stations represent those external influences having the ability to shape the will of the people in a manner unknowable to US strategists and planners.³²

It is the unpredictable nature of the butterfly’s wings that illustrates how difficult it is to manage the “E” in EBO. Do war planners truly have access to the intelligence and information required to shape and influence the battlespace? Do we truly have the capability to shape the will of the Muslim world when external influences as small as the flap of a butterfly’s wings can throw a plan into disarray? What higher-order effects did the simple act of a young Marine innocently placing a US flag on a statue of Saddam Hussein generate? Or similarly, what was the antithetical effect generated by the prisoner abuse scandal at Abu Ghraib?

The answers to these questions are subjective at best and unknowable at worst.

Fortunately, “EBO planners are intensely aware that today’s dynamic and politically charged environment may invalidate one preference and create another in the space of a single headline.”³³ Both the 2005 National Defense Strategy (NDS) and the 2004 NMS address the issue of higher-order effects in the GWOT. The NDS “recognizes the limits of intelligence and the impossibility of predicting complex events with precision,”³⁴ while the NMS states that “. . . commanders must expect and plan for the possibility that their operations will produce unintended 2nd- and 3rd-order effects.”³⁵ Knowing and expecting that US forces will encounter higher or *n*th-order effects is an important first step in translating EBO thought into practice. However, managing the actual outcomes of the effects themselves is the real challenge. Perhaps, it is with this in mind that Colonel Read writes, “EBO retains identity more as a mind-set, a way of thinking, or as an organizing framework rather than an intricately designed and lockstep planning cycle.”³⁶ As with capabilities-based planning in the planning, programming, budgeting, and execution cycle, the translation of strategy into tactical task and subsequently into manageable effects is at best “squishy.”³⁷ The time dilemma in EBO only magnifies the difficulty in managing these higher-order effects.

Assessment and the Time Dilemma: Too Fast and Too Slow

Managing higher-order effects in EBO is no doubt a challenging feat. Managing and assessing these higher-order effects under the scrutiny and in the context of a 24-hour news cycle borders on the impossible. The dilemma encountered by EBO strategists and planners is how to stay ahead of Al-Jazeera’s and CNN’s considerable intelligence-gathering capability and yet have the patience to assess the ripples created by stone skipping. This paradoxical time dilemma—assessing ripples too quickly and reacting to news cycles too slowly—is in all likelihood the most challenging obstacle facing EBO practitioners.

As mentioned, technological connectivity aids the chameleon-like terrorist and insurgent forces in the GWOT. How-

ever, this same technological connectivity also links the non-adversarial civilian population to various sources of real-time news and information. Television's "ability to provide graphic images and instantaneous and/or critical information," has had a profound effect on war and on policy.³⁸ Al-Jazeera and stations in its ilk have shown how the media's "global reach" can influence and shape public opinion and "has made [them] a major player in limited conflict and peacekeeping deployments."³⁹ Additionally, as technological connectivity increases, the public's demand for information has created a "pulling" effect for real-time news and information.⁴⁰ Consequently, this almost democratic-style, bottom-to-top flow of information has had a dramatic impact on how leaders shape their foreign policy with respect to public opinion.⁴¹ Increasingly, EBO strategists and planners must contend not only with the effects of their own ripples, but also with the effects of media aftershocks.

Assessing the aftershocks and ripples, particularly in an environment like the GWOT, becomes the most difficult and painful aspect of translating EBO theory into practice. Paul Davis from the RAND Corporation calls it the "grand challenge" for EBO analysts, noting that "assessments of impact are often weak because many effects are indirect or uncaptured."⁴² Throughout history, airpower strategists have used a variety of means to plan and assess EBO in practice. However, as USAF major Jay Kreighbaum states, "These theories have some universal shortfalls that are an outcome of the inherent complexity, uncertainty, and unpredictable nature of warfare."⁴³ Additionally, higher-order effects may exhibit a large time lag as ripples migrate through a system. In Bosnia, North Atlantic Treaty Organization forces counted the number of gardens and noted the price of cabbages to ascertain the socioeconomic condition of the Bosnian Serbs.⁴⁴ But even these seemingly revealing measurements may be misleading in a highly dynamic environment.

The most current joint guidance, JWFC Doctrine Pam 7, attempts to operationalize assessment using two criteria—measures of performance (MOP) and measures of effectiveness (MOE). MOPs focus on "task accomplishment" and whether an action was done right. MOEs focus on "effects attainment" and whether the right things were done. This guidance is sufficient for operational or tactical level, force-

on-force application; however, in the dynamic GWOT environment, strategic assessment may require a more robust construct that spans across USJFCOM's PMESII construct. As Colonel Read noted in his article on small wars and EBO, "In a practical sense, only the tactical is visible to coalition planners, yet insight into the tactical does not necessarily lead to actionable higher-level insights regarding the insurgency."⁴⁵ Although an indispensable part of the EBO strategy and planning process, assessment teams must use a broad artist's brush to assess how effects migrate through a system, particularly in a complex environment such as the GWOT. Additionally, they must learn to frame the operating context using the appropriate cultural lens.

Framing the Adversary through Al-Jazeera's Lens

Few people believe news reporting is truly objective in nature. One only has to compare the news content of Al-Jazeera's Web site to CNN's on any given day to see the dramatic disparity in what both sides call objectivity. Disconnects and outright differences between contextual frameworks and cultural perceptions help explain how one man's terrorist is another man's freedom fighter. In the GWOT, the translation of EBO theory into practice depends in large part on how well we frame and package desired effects.

In April 2005 McDonald's celebrated its 50th anniversary. With over 30,000 stores in 119 countries, the success of the famed golden arches has become legendary.⁴⁶ A key component of McDonald's international marketing strategy is how it modifies its menu to fit the flavor and culture of the individual country. Israeli McDonald's are either kosher or nonkosher. In Germany McDonald's serve beer. McDonald's restaurants in India do not serve beef. Additionally, McDonald's sells their franchises to local businessmen who have a much better understanding of the regional culture and environment. The adaptive and diplomatic manner in which McDonald's has succeeded in various worldwide markets is an impressive display of how modifying an existing framework can yield the desired effect.

Strategists and planners must take a similar tact when applying an EBO methodology to an environment such as the GWOT. Prof. Bernard Lewis writes, "The study of Islamic

history and of the vast and rich Islamic political literature encourages the belief that it may well be possible to develop democratic institutions—not necessarily in our Western definition of that much-misused term, but in one deriving from their own history and culture and ensuring, in their way, limited government under law, consultation and openness, in a civilized and humane society.”⁴⁷ To achieve a desired end state, EBO practitioners must frame strategic-, operational-, and tactical-level effects from a cultural lens that may be far different from their own. The challenge remains, however, that “military folks like clear objectives, unity of command with clear responsibilities and accountability, and quick results.”⁴⁸ The human touch displayed by Special Operations Forces in Afghanistan and Iraq illustrates the cultural awareness needed by EBO strategists and planners in the GWOT.

The Predator and Special Operations Forces—The Human Touch, Information Fusion, and Relevant Capability

Since 2001 the General Atomics MQ-1B Predator unmanned aerial vehicles (UAV) and the aircrews that fly them have earned the respect of a number of admirers—from the most senior leaders in the White House to the most junior Special Forces troops on the ground in Iraq and Afghanistan.⁴⁹ Publicity and press aside, the Predator’s persistent, integrated intelligence, surveillance and reconnaissance (ISR) capability and its ability to launch precision-guided munitions such as the AGM-114 Hellfire missile have made it an invaluable tool in the GWOT. Although most military pilots still balk at the idea of “flying” UAVs, the fact remains that the Predator’s weapon system has proven its worth to both military and civilian leadership time and time again.

But the real lessons we can learn from Predator extend far beyond the novelty of an unmanned, remotely piloted vehicle. For all its capability and celebrity, the Predator and its tethering to SOF units, provide valuable lessons on how to maintain relevance in the GWOT.

Central to the success of EBO in the GWOT is the human touch—the ability of US forces, aided by the most current

technology, to influence and understand the adversary's operating context. Improved cultural awareness and language training has become an operational imperative in the GWOT and EBO. Next, US forces must be able to access a knowledge collective—a holistic pool of diplomatic, informational, military, and economic intelligence created and maintained through seamless integration and information fusion. Decision makers and operators must practice and recognize how near-omniscient knowledge of the battlespace both helps and hinders centralized control and decentralized execution. Finally, US forces must learn to incorporate adaptive and disposable technology into their operational playbooks at a rate that may seem disconcerting to traditional airpower practitioners.

In the Stirrups of Horses—The Human Touch

During Operation Enduring Freedom, SOF teams scoured the mountains of Afghanistan in the search for Taliban and al-Qaeda fighters. Although the superiority of US technology went largely undisputed, the SOF teams and their personal rapport with Northern Alliance armies and their understanding of the local culture were significant factors contributing to the success of the US-led operation. The SOF teams' well-worn boots, in both the stirrups of Afghani horses and in the sands there, are a telling reminder that the human element in effects-based operations is of critical importance to the continued success of US forces in the global war on terrorism.

The Department of Defense has reiterated the importance of this human touch with the recent release of the Defense Language Transformation Roadmap.⁵⁰ At the release of the roadmap, Undersecretary of Defense for Personnel David S. Chu said, “[military linguists] must be able to understand people speaking in nuanced terms or alluding to current or historical events in a culture.” He went on to say that “people working in the field must also be able to understand the political environment and the leaders working in that environment.”⁵¹ Today, ground troops preparing to deploy to Iraq receive a healthy dose of sensitivity training on “Iraqi culture and social traditions” covering a wide range of scenarios from “conducting house-to-house searches” to dealing with

“Iraqi civilians irate over damage to their homes . . . or the death of a family member.”⁵²

Nothing underscores the effectiveness of cultural knowledge better than the experience of Lt Col Chris Hughes, US Army, who, in April 2003, faced an angry mob of Iraqi citizens in the city of Najaf. Colonel Hughes “ordered his soldiers (from the 101st Airborne Division) to take a knee and point their rifles toward the ground.”⁵³ The restraint Hughes demonstrated calmed the crowd and defused what in all likelihood would have been an explosive situation.

But all this is not to downplay the significant role that technology has played in aiding the human touch. In a recent *Air and Space Power Journal*, Lt Gen Michael Wooley wrote, “. . . not a single SOF unit in OIF with an AFSOC [Air Force Special Operations Command] combat controller who had a small UAV was ambushed by enemy forces—and that is quite a testimony.”⁵⁴ He went on to say, “In the future, I want every combat controller to deploy with a small UAV.”⁵⁵ UAVs aside, perhaps nothing is more indicative of the human touch than the image of SOF teams on horseback, equipped with the latest weapons, Global Positioning System (GPS)-aided trackers, and communications gear, tethered to airborne strike platforms loaded with 2,000-pound bombs.

The Holistic Knowledge Collective and Information Fusion

The speed at which UAV technology has come of age is truly astonishing. Perhaps more astonishing, however, is how quickly reach-back capability and information fusion have become indispensable parts of military operations. “In Iraq, it’s just as important for a patrol to have information as it is for a division commander. In fact, it may be more important,” said Gen Richard Myers, USAF chairman of the Joint Chiefs of Staff during a recent USJFCOM symposium.⁵⁶ The connectivity of the Predator UAV full-motion video feed with geographically separated ground troops, intelligence units, and other organizations has reached a point where tactical-, operational-, and strategic-level decision makers all have access to the same real-time information. Controllers communicating via secure network Microsoft Internet Relay Chat (mIRC) rooms provide a play-by-

play analysis of real-time Predator footage and attempt to enhance the situational awareness of a large virtual audience.⁵⁷ Frontline ground units share time-critical information instantaneously with Predator crews, while intelligence organizations analyze and disseminate relevant mission information received.

This virtual knowledge collective is a central imperative for the success of effects-based operations in the GWOT. Operators must be able to exploit any fleeting intelligence relating to a thinking, reacting enemy. In his book *Business @ the Speed of Thought*, Bill Gates describes this collective as a “digital nervous system.” “It’s like the human nervous system. The biological nervous system triggers your reflexes so that you can react quickly to danger or need.”⁵⁸ USJFCOM articulates the concept of a knowledge collective in the form of a “collaborative information environment”—a central element of the transformational capabilities required for the employment of joint effects-based operations.⁵⁹ USJFCOM has taken steps to translate theory into practice by recently creating the *Iraqi Portal*, “an open-standards, open-architecture, open-source portal that integrates data and documents so that authorized partners can get and share information across all security levels.”⁶⁰

The dynamic nature of the GWOT environment requires information fusion at all levels and in all arenas. A systems approach and the need to manage and influence higher-order effects make the concept of a knowledge collective even more applicable to an EBO methodology. The 2005 NDS clearly emphasizes the necessity for technological fusion stating, “We seek to fuse operations and intelligence and break down the institutional, technological, and cultural barriers that separate them. This will enable us better to acquire, assess, and deliver critical intelligence both to senior decision makers and to warfighters.”⁶¹ From Bill Gates’ perspective, “How you gather, manage, and use information will determine whether you win or lose.”⁶²

Maintaining Relevance through Disposable Technology

“Do not repeat the tactics which have gained you one victory, but let your methods be regulated by the infinite variety of circumstances,” said Sun Tzu.⁶³ In the GWOT, the urban

jungles, chameleon-like adversaries, and amorphous centers of gravity, indeed, seem to reflect the very “circumstances” of which Sun Tzu speaks. To employ the art of effects-based operations in this type of dynamic environment demands the right technology, at the right time and in the right hands. “Technology is a wonderful thing; however, technology has to be relevant,” said General Wooley.⁶⁴ Perhaps it is the relevance of UAV technology in the GWOT that has made it such an attractive platform to military operators.

From the layman’s perspective, the Predator’s main attribute to military operations is its “unmanned” characteristic. Although an operator still “flies” the aircraft from the ground, no one actually sits in the aircraft during flight. In truth, however, the Predator’s greatest contribution towards effects-based operations lies in its relatively quick developmental timelines and disposable nature. EBO in the GWOT requires adaptive and disposable technology similar to today’s cell phone or laptop computer. The disposable nature of UAVs allows design engineers and operators to take advantage of the latest technology quickly and relatively cheaply. The 60 percent design solution may be preferable to a long development and testing timeline.

During the initial start-up of Predator in 1995, prototypes were deployed to Hungary in support of operations over Bosnia in less than 18 months. Shortly thereafter, the USAF developed a combat variant capable of launching the AGM-114 Hellfire missile. The testing cycle for this version again followed a greatly accelerated development and testing timeline. A study released by the Government Accountability Office (GAO) on 9 March 2005 hailed the Predator’s “innovative advanced concept technology demonstration approach.”⁶⁵ In the same study, however, the GAO also warned that the “DOD still lacks a viable strategic plan and oversight body to guide UAV development efforts and related investment decisions.”⁶⁶ It should be noted that the Predator reached initial operating capability on 1 March 2005, nearly two and a half years *after* the first generation Predators had been retired.

The translation of EBO thought into practice requires an operational mind-set that embraces change and adaptability. Budgetary considerations and political involvement notwithstanding, senior leaders must scrutinize the cost of ac-

quisition programs and recapitalization efforts. New capabilities must be thoroughly vetted against operational necessity. Additionally, operational leaders must combat parochial attitudes regarding doctrine, tactics, techniques, and procedures. Technological relevance requires continuous review of standing doctrine and operational methods. The military can ill afford to operate using outdated methods against an ever-evolving adversary.

In the Eye of the Beholder—Critiques and Recommendations

The complexity of the GWOT creates numerous challenges for EBO practitioners. This paper has argued that effects-based operations are inherently difficult to conduct in an asymmetric environment like the GWOT because of the conditions surrounding the adversary and the inability to manage and assess higher-order effects. However, one cannot dispute the progress that has been made in the effort to operationalize both destructive and constructive effects-based operations.

USJFCOM has taken the lead on a number of relevant issues relating to translating EBO thought into practice.⁶⁷ Education and training initiatives at the various professional military education schoolhouses should sow the seeds for the next generation of EBO practitioners. As our battlespace awareness and technological connectivity improve, the collaborative information environment proposed by USJFCOM will become a realistic mechanism to share and assess information. Finally, gains in the joint inter-agency coordination process continue to be realized with the stand-up of the Department of State's Coordinator for Stability and Reconstruction.

If the current-day operational picture is any indication, an effects-based methodology seems to be on its way to achieving desirable end states in both Iraq and Afghanistan. Security and reconstruction efforts led by US forces in Iraq and Afghanistan have greatly contributed to what, by all accounts, appears to be a spreading optimism in the region. Recent elections in Afghanistan and Iraq have solidified fledgling democracies in two of the most tumultuous regions in the world, and US and coalition forces con-

tinue to train large numbers of Afghani and Iraqi security forces. Although attacks on Iraqis have increased, insurgent strikes on US forces have decreased. Finally, despite the high operations tempo in the Middle East and Afghanistan, US forces were quickly able to respond to tsunami relief efforts in Southeast Asia. These constructive efforts will hopefully yield lasting, positive effects in the minds of many Muslims.

Despite the successes in EBO practice, the most difficult challenge facing EBO thinkers today is the parochial mindset of those who knowingly choose to stay with irrelevant and outdated doctrine and technology. EBO and airpower practitioners must recognize that solutions may in fact come from outside the realm of traditional thought and practice.⁶⁸ US forces must embrace transformational doctrine and technologies to maintain relevance in a complex environment like the GWOT.

Finally, the fluidity and dynamic nature of the GWOT requires an organization with the access and ability to employ the full spectrum of strategic- and operational-level instruments of power. Disconnects between the State Department, Department of Homeland Security, the Treasury Department, and other agencies will continue to exist without legislative action that encourages and demands closer coordination and integration. Consideration should be given for follow-on legislation similar to the 1987 Goldwater-Nichols Act—legislation that will expand and solidify the definition of interagency operations.

Conclusion

Translating EBO thought into practice is a daunting task in today's network-centric environment. The chameleon-like character of our GWOT adversaries and the interdependent, complex nature of globalization greatly hinder our ability to manage and assess the ripples of seemingly well-thought-out destructive and constructive actions. Despite these challenges, EBO practitioners should make every effort to improve the collaborative information environment and maintain an adaptive, responsive posture at the strategic, operational, and tactical levels.

In the end, success in translating EBO thought into practice will stem from a change in operational mind-set rather than the realization of an elegant model, solution, or road-map. Microsoft, Al-Jazeera, and the Predator are useful but incomplete illustrations of a challenging and complex problem. If the translation of EBO theory into practice is to succeed, airpower practitioners must approach effects-based operations from a nonparochial perspective that may be best viewed from outside the realm of traditional military thought and practice. Recognizing EBO as an art rather than as a science will be the first step in this process.

Notes

(All notes appear in shortened form. For full details, see the appropriate entry in the bibliography.)

1. CADRE, *Joint Air Estimate Planning Handbook*, 65–69. Many other airpower theorists have shared the tactical essence of EBO.

2. Runals, “Transformational Capabilities.”

3. Meilinger, “Origins of Effects-Based Operations,” 116.

4. Ibid. Meilinger wrote, “During most of World War II, the analytical, cognitive, and intelligence tools needed to determine the effectiveness of air operations were lacking on the strategic level.” He also wrote, “Today, there are more efficient ways of evaluating effects-based operations, yet there is still a search for a methodology to apply to them.”

5. Senge, *Fifth Discipline*, 68.

6. Ibid.

7. Ibid.

8. Ibid., 69.

9. Kreighbaum, *Force Application Planning*, 9–18. Kreighbaum provides a particularly clear and comprehensive discussion of some of the various elements and characteristics of EBO cause and effect.

10. Deptula, *Effects-Based Operations*, 5 and 19. General Deptula also wrote, “. . . the crucial principles defining parallel warfare are how time and space are exploited in terms of what effects are desired, and for what purpose, at each level of war—the essence of effects-based operations.” He goes on to write, “Systems-based intelligence analysis is critical to the application of effects-based operations. Without adequate information about what an adversary relies on to exert influence and conduct operations, parallel war cannot be effective.”

11. Cain, “EBO Universe,” Electronic Mindmap Diagram. The classification of effects as either “destructive” or “constructive” is a useful nomenclature to categorize EBO.

12. Ibid. Examples of destructive actions are deny, destroy, delay, isolate, neutralize, disrupt, and inform. Examples of constructive actions include educate, confirm, sustain, encourage, construct, heal, feed, restore, comfort, protect, liberate, and legitimate.

13. Ibid. These system elements include things such as social needs and war-fighting capability.
14. Gross, *Forbes Greatest Business Stories*, 343–45.
15. Definition: “Phishing” is the downloading of seemingly benign code. An e-mail from a fictitious bank requesting personal information is an example.
16. Gates, remarks.
17. Predator UAV footage shows insurgents heating up the asphalt roads and burying an improvised explosive device. The Predator subsequently is shown destroying the target area with a Hellfire missile. Document is now declassified.
18. Clausewitz, *On War*, 149. “The essential difference is that war is not an exercise of the will directed at inanimate matter, as is the case with the mechanical arts, or at matter which is animate but passive and yielding, as is the case with the human mind and emotions in the fine arts. In war, the will is directed at an animate object that reacts.”
19. Author’s personal experiences.
20. Tse-tung, *On Guerrilla Warfare*, 454.
21. Read, “Effects-Based Airpower,” 105.
22. *National Strategy for Combating Terrorism*, 6. “Whether through ignorance, inability, or intent, states around the world still offer havens—both physical (e.g., safe houses and training grounds) and virtual (e.g., reliable communication and financial networks)—that terrorists need to plan, organize, train, and conduct their operations.”
23. *National Military Strategy*, 5.
24. Statement of Rubinstein.
25. Friedberg, testimony.
26. Gates, RSA Conference. Mr. Gates spoke of several additional software issues related to security including isolation and industry involvement.
27. Ibid.
28. Ibid.
29. El-Nawawy, *Al-Jazeera: Story of the Network*, 30.
30. Mainly because of its airing of numerous Usama bin Laden tapes.
31. Lorenz, “Predictability?”
32. The author uses Al-Jazeera to represent external influences in the GWOT. It is not the only station, nor is television the only medium by which Arabs and Muslims receive their news. The religious Imams have an enormous influence on the will of the people associated with the GWOT.
33. Read, 106.
34. *National Defense Strategy*, 11.
35. *National Military Strategy*, 5.
36. Read, 104.
37. During a briefing on the current planning, programming, budgeting and execution process, a contractor used the term *squishy* to describe the difficulty in translating strategic guidance into funded programs.
38. Ammon, *Global Television*, 134.
39. Young and Jesser, *Media and the Military*.
40. Johnson, *Emergence: Connected Lives of Ants*, “In the late eighties, changes in the flow of information—and particularly the raw footage so

essential to televised news—had pushed the previously top-down system toward a more bottom-up distributed model.”

41. Ammon, 143. In the section “Global Television’s Indirect Effect,” Ammon writes, “Real time television can also exert an indirect influence on policy. Under this construction, global television first shapes public opinion, which subsequently influences foreign policy. The traditional model of foreign policymaking, the elite model, saw policy as being crafted solely by professional diplomats and their masters.”

42. Davis, *Effects-Based Operations*, 5 and 10. “The EBO movement is timely, interesting, and important; it poses a grand challenge to the analytical community.”

43. Kreighbaum, 31.

44. Newman, “Why NATO Counts Cabbages,” 36.

45. Read, 105.

46. Information from www.mcdonalds.com/cor/about.html.

47. Lewis, *Crisis of Islam*, 168–69.

48. Runals, e-mail, 2005, from USJFCOM writes, “Our organizations and training are designed to ‘play capture the flag.’ Unfortunately our adversary increasingly does not have flags to capture, is adaptive in operation and time has little importance. To respond to this, we have to rely on building unity of effort among a group of joint, interagency, multinational players. That takes time, effort and a different way of thinking about ourselves, the adversary and the operational environment, that’s where an effects-based approach comes in.”

49. Woodward, *Bush at War*, 223. Additionally, the author uses his own personal experiences with Special Forces units while assigned to the 15th Reconnaissance Squadron.

50. Dated April 2005.

51. Graham, “Pentagon to Stress Foreign Languages,” 4.

52. Martz, 2C.

53. Komarow, “Unexpected Insurgency Changed Way of War,” 17.

54. Wooley, “America’s Quiet Professionals,” 63. Time span was during the first six weeks of combat operations in Operation Iraqi Freedom. General Wooley is the commander of Air Force Special Operations Command.

55. *Ibid.*, 64.

56. Sanderson, “Communication Key to Fighting Terrorism.”

57. Wooley, “America’s Quiet Professionals,” 65. General Wooley also states, “During OEF [Operation Enduring Freedom] we increased the combat capability of every one of our gunships by integrating a real-time video feed from the Predator UAVs.” The author bases these observations on practical experience in the CAOC [combined air operations center] and during Predator operations supporting OEF and OIF from 2002–2004.

58. Gates, *Business @ the Speed of Thought*, xvii.

59. Runals, “Transformational Capabilities.”

60. Walker, “Web Portal for Sharing.” The “‘Iraqi Portal’ allows information sharing at every level, especially with coalition partners and the Iraqi government. It also provides text-chat capability and a Web-based common operational picture.”

61. *National Defense Strategy*, 12.

62. Gates, *Business @ the Speed of Thought*, 3.

63. Tzu, "Sun Tzu on the Art of War," 342.
64. Wooley, "America's Quiet Professionals," 63.
65. Unmanned aerial vehicles, 11.
66. *Ibid.*, abstract.

67. Runals, e-mail. "The PMESII construct is being operationalized in a number of places—MNC-I and MNF-I the most visible. It is also being included in the rewrites of the JPs indicated above. There has been less integration by interagency within this process than I would like but there are a number of efforts going on to correct that. The Department of State has established a Coordinator for Stability and Reconstruction, an office that works to integrate interagency operations and support for phase IV planning. They are very involved in SC and EUCOM and helped XVIII ABC prepare for their deployment to IZ. There is also a growing effort at OSD to provide earlier and more continued involvement of interagency during plan development. Other mechanisms to further operationalize an effects-based approach to planning and operations, in addition to those identified above, include a decision by Service joint mil education committee to include EBO-related instruction in service schools, development of a distributed training package, increased numbers of requests to training in EBO-related subjects by Service HQs and joint commands and interest by foreign nations."

68. Bender, "In Iraq, Army Takes Lesson." In this article, Army units study urban gangs in an attempt to understand the mentality of insurgents. Ground forces appear more capable of thinking "outside of the box" than their airpower counterparts.

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